Pests

AND THEIR CONTROL

1942
FEBRUARY
VOL. 10 NO. 2

ORGAN OF THE PEST CONTROL INDUSTRY

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Entomologists
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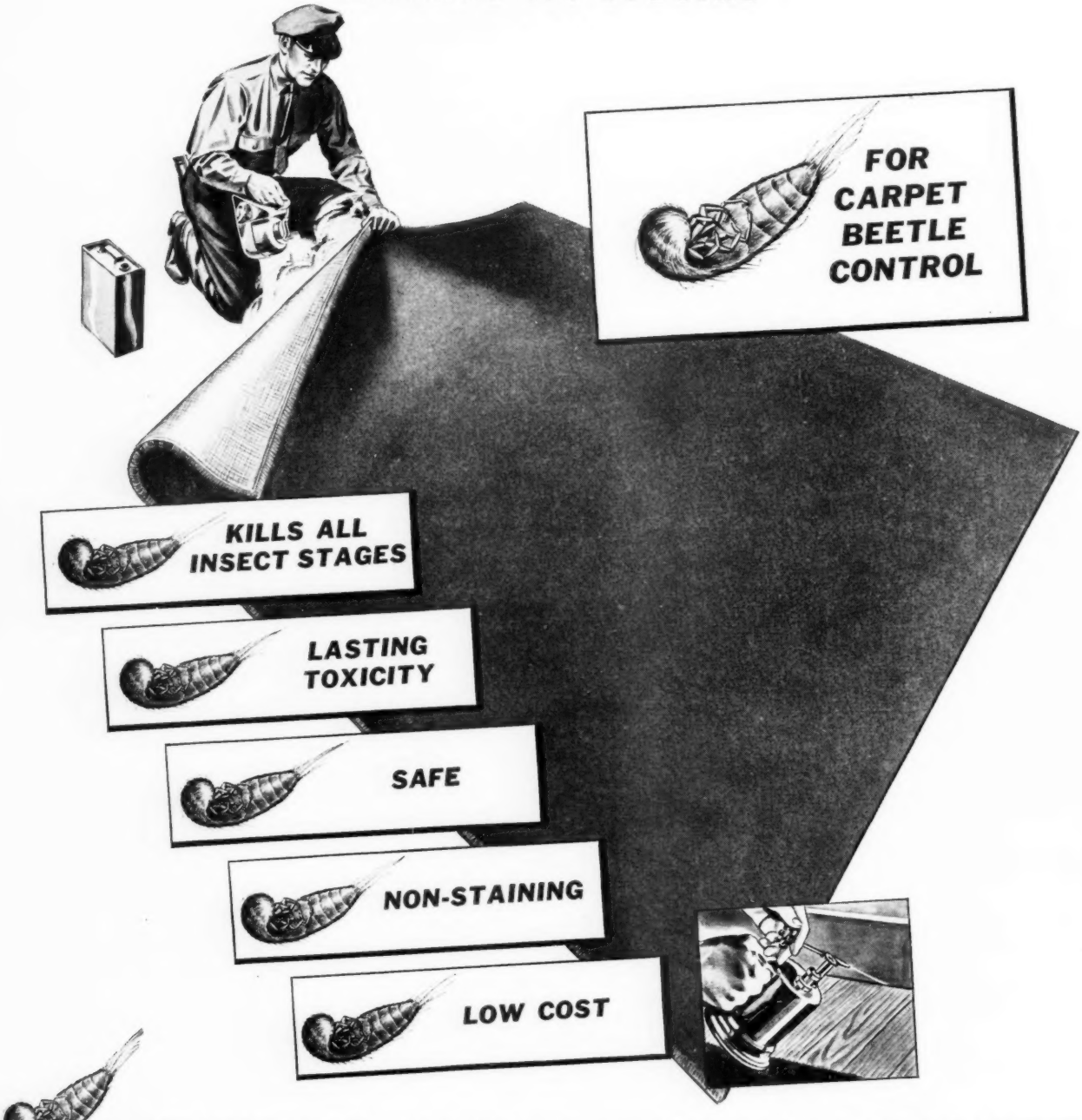

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Pests

and Their CONTROL

COOPERATING WITH NATIONAL PEST CONTROL ASSOCIATION

Exterminators, Fumigators, Termite Control Operators, Entomologists, Insecticide and Supply Manufacturers

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STATEMENT

The National Association appreciates the co-operation given by way of publicity. The Association is not responsible for articles published unless credited to the Association. The list of officers and directors is published for informational purposes only.

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"Contributed articles in this publication do not necessarily reflect the opinions of the editors. The editors invite discussions, comments and all types of literary material pertaining to pest control and pests from any person interested in the advancement of the field."

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EDITORIAL

Axis Bombs and Pest Control

THAT the members of the pest control industry—individually or collectively—can contribute materially to energizing the war effort is undeniable; that the spirit of cooperation prevades the industry is also undeniable; the only question is just how, where and in what way its services can be made to function most effectively.

Not so very long ago a German bomber tangled with a British balloon barrage and pirouetted to earth, its utility as an agency of destruction ended; its utility as a source of valuable information just beginning. Examination of the plane by aviation engineers revealed the disquieting news that it had a one-way flight range from Europe to cities along the Atlantic seaboard with a bomb-load of sizeable destructive proportions.

There's no need to dwell on the potential implications of this Axis assembly line reality, except to consider just how to cushion the effects of such bombings, if and when they occur. In this particular we have in mind a London cabled news item which appeared in the N. Y. Times early in '41, head-lined "RAT PLAGUE BEGUN IN BRITAIN BY RAIDS—Health and Food Supplies of Country Menaced as Pest Spreads with Bombings" and which item the N.P.C.A. caused to be reprinted for its membership at the time.

Here reprinted are some excerpts from this article, which because of the parallel involved draws a picture of the shape of things that may well come about:

> **"It is slowly dawning on the people of Great Britain that the continual bombings have brought on a plague of rats with which they must contend. The government has launched a publicity campaign . . . to curb this menace to national safety which is doing an annual damage of 25,000,000 pounds.**
>
> **There is about as much chance of holding down rats in wartime as there is a likelihood that the Pied Piper will return in answer to prayers. But it is obvious that conditions would get far worse unless the government stepped in.**
>
> **One sidelight of the recent fire bomb attack on the oldest district of London . . . was a statement that flames reducing scores of buildings to mounds of smouldering embers still left some 250,000 rats alive. Presumably countless hordes of them fled from the scene of ruin to find new homes. The man who is authority for this opinion is William Dalton, member of a family that has been studying the catching of London rats since 1710.**
>
> **In the urban communities the creatures take advantage of battered houses easily entered. Black or ship's rats have been found infesting steel and concrete buildings believed impregnable. They have filtered in by roofs, gutters, rain pipes, doors and windows or where the shock of a nearby explosion has opened a hole or crevice.**
>
> **Great Britain's method of coping with them parallels action taken against incendiaries in that responsibility is handed on to local authorities and ultimately to the individuals occupying infested premises. They must watch for fires from the sky and for rats from the ground—failure in either case leads to fines. There is nice legislative sample of "buck passing" entitled "Rat Order" covering all this.**
>
> **A joint proclamation of the Food Ministry and Ministry of Agriculture urges co-operation in the drive for destruction of rats which "do untold damage to our food supplies." It is explained that a big onslaught must be made in granaries and warehouses.**
>
> **Owners of factories and shops are informed: Rats do an enormous amount of damage to our stocks and other essential commodities. In wartime it is a matter of urgent national importance. The government departments most closely concerned with our food stocks have therefore contrived to organize a nation-wide onslaught on the rat and urge you to make most active continuous use of every available means of destroying this enemy in our midst.**
>
> **Furthermore, the point is driven home that rat killing is not something that can be put off, because if one citizen obediently clears up rats while his neighbor fails, both suffer."**

Naturally the control of rat and other pest problems of the magnitude indicated will have to be under the auspices of national and local governmental agencies; but we are convinced the P.C.I. with its expert knowledge and its experienced service organizations, can do a great deal to cooperate successfully in curbing the effects of any pest situation which may explode into being.

Bombing raids rarely fail to produce disastrous fires in their wake. Draperies, rugs, upholstered furniture in the home, once ignited can spread like wildfire and so add to the holocaust. To delimit this hazard, flameproofing of such household articles may, we think, readily come within the bounds of industry service as a war measure.

Obviously, there are many other facets to this question of industry war service. One can hardly pick up a newspaper or a magazine these days without reading about pests and public health, and their relation to the present war situation, some aspects of which we hope to comment on at a later date.

Since the question of priorities has been a serious one for the industry, may we quote in closing two sentences in point from W. J. Zick's talk on "SANITARY PRODUCTS" at the N.A.I.D.M. Convention, December 1, 1942:

> **"The amount of raw materials required by our industry in any one category is relatively small, and would do little in the way of curtailing other defense projects. For the small amount of material involved the results will be very important to the health of the nation."**

Correction: Tartar Emetic in Ant Poison No Repellent

THE story of the N.P.C.A. San Francisco Convention which appeared in November, 1941, PESTS, erroneously quoted Robert E. Hackley to the effect that tartar emetic may be used as an ant repellent under certain conditions. Contrariwise, he stated that ants readily take tartar emetic when it is suitably compounded and on the basis of his own experience produces effective results, though he did not wish to recommend it for general use nor to be quoted as so doing. His tests also indicated that tartar emetic has been acceptable to ants in greater degree than arsenic. Failure of old experiments was due to factors other than tartar emetic. On the basis of the experiments thus far, Mr. Hackley indicates the question

of optimum dosage has not been settled, though it would appear an upward revision can be made without loss of attractiveness.

Since preparation of the foregoing correction, we are in receipt of further word from Mr. Hackley to the effect that sirup containing 0.7 of one per cent of tartar emetic is well liked by Argentine ants in his locality—Palo Alto, Calif., and he adds, he is continuing trials of certain arsenic compounds because he is well pleased with the first trials of one of them.

Our thanks to Mr. Hackley for his interest in setting the record straight, thereupon serving to correct any false impression created due to our inadvertent mis-quotation of the supposed repellent properties of tartar emetic in ant poison. Praise is particularly due him for his splendid scientific spirit as manifested by his pest control research activities.—EDITOR.

The February issue went to press before the Southern Conference complete story could be written, but it will appear in the March issue.

Fifth Pacific Coast Pest Control Operators Conference

February 19-20-21, 1942

THE FIFTH Annual Pacific Coast Pest Control Operators Conference will be held February 19, 20 and 21 on the campus of the University of California at Berkeley. Professor William B. Herms, head of the Department of Entomology of the University of California, again will serve as Conference Director.

Special laboratory sections have been planned to cover (1) rats and their control, and (2) insects of importance in sanitation and public health, as well as (3) ants, (4) household pests, (5) structural pests, and (6) control methods and materials. In addition, authoritative lectures and round table conferences will also be held. Special sections will be held for newcomers to the conference as well as for old-timers.

Because of the great national emergency this conference now assumes a great importance. The need for preservation of health, conservation of food, and protection of our homes and buildings from the ravages of insects and other pests is greater than ever before. Every pest control operator on the Pacific Coast ought to arrange to attend if at all possible.

PROGRAM

Fifth Annual Pacific Coast Pest Control Operators' Conference University of California, Berkeley, Calif. February 19, 20, 21, 1942

Wednesday

6:00 p.m. to 10:00 p.m. Registration at Hotel Durant.

Thursday

8:00 a.m. to 8:45 a.m. Registration at Hotel Durant.

Thursday

Agriculture Hall—Room 113

9:00 a.m. Address of Welcome—S. B. Freeborn.

9:15 a.m. Recent Developments in Pest Control—G. F. MacLeod.

10:00 a.m. Attractants and Repellents—W. M. Hoskins.

10:45 a.m. Recess.

11:00 a.m. Biological Interrelations of Household Insect Pests —E. O. Essig.

11:45 a.m. Outline of Laboratory Program and Announcements.

12:00 Noon The PCO in War Time: Hotel Durant—E. G. Mills.

Thursday, Agriculture Hall

1:30 p.m. Laboratory Sections (Dooryard Pests, Rodents, Fundamentals of Entomology).

NOTE: These laboratory sections are for one day only and will be given in two sections.

3:00 p.m. Laboratory Sections (Dooryard Pests, Rodents, Fundamentals of Entomology).

4:30 p.m. Availability of Insecticides in the Present Emergency—A. Fliebut.

7:30 p.m. Agriculture Hall. Drawing Up the Entomological Battle-Lines for Action—

I. Front Lines — W. B. Herms.

II. Supporting Lines—E. O. Essig.

III. Home Front — G. F. MacLeod.

This Meeting Is Open to the Public.

Friday, Agriculture Hall

9:00 a.m. Laboratory Sections (Public Health, Structural Pests, Household Pests, Ants).

10:30 a.m. Laboratory Sections (Public Health, Structural Pests, Household Pests, Ants).

12:00 Noon Facts About Wood of Particular Interest to the Pest Control Operator—Emanuel Fritz. Hotel Durant, Main Dining Room.

Friday, Agriculture Hall

1:30 p.m. Mechanisms of Infection of Arthropod-Borne Diseases—W. B. Herms.

2:15 p.m. Biology and Control of Ants—J. E. Eckert.

3:00 p.m. Recess.

3:15 p.m. Household Rodents— T. Storer.

4:00 p.m. Fungi—H. N. Hansen.

(Continued on page 23)

Purdue Conference a Success

"SCIENCE Again Cooperates With Industry" was the slogan of the Sixth Annual PCO Conference held at Purdue University, Lafayette, Indiana, January 5-9. This sixth annual conference was without a doubt the most successful of all, especially in interest, attendance, industry attitude and cooperation. The attendance, not including staff instructors and wives, was 119, representing 21 states and Canada. Representatives were present from such distant states as North and South Dakota, Nebraska, Colorado, Texas, Georgia, Massachusetts, and New York. Thirty were from Illinois, 19 from Ohio, 13 from Indiana, and 7 from New York.

It is interesting to note that 37 attended the Conference for the first time and ten (Wm. O. Buettner, C. Norman Dold, George L. Hockenyos, Harlem B. Ives, W. E. McCauley, C. O. Partlow, W. W. Scott, E. F. Sennewald, Jules B. Smith, and Arthur Srebren) attended the Conference for the sixth consecutive year. The records show that during the six years a total of 337 different PCOs have attended and they have come from 30 states and Canada.

The Conference was opened Monday morning (January 5) by J. J. Davis, director of the Conference, who was followed by Dean H. J. Reed, who welcomed all to the Purdue Campus. The remainder of the morning session dealt with discussions by B. E. Montgomery, H. O. Deay and J. J. Davis on Entomology fundamentals, including Insect Morphology and Physiology, Insect Reproduction and Development, and Principles of Insect Control.

Monday afternoon was divided into two groups, each group spending two hours on Insect Classification under Dr. H. O. Deay and two hours on rat problems, including a Bio-Assay demonstration by G. C. Oderkirk, Cooperative Rat Campaigns by Al M. Akers, and Baits for Rats and Mice by G. C. Oderkirk.

Monday night most of the members of the Conference saw a thrilling Conference game between Michigan and Purdue, the final score being 36 to 18 in favor of Purdue, Morton Prescott not withstanding.

Tuesday morning included a variety of problems as following: Dr. E. N. Woodbury gave a demonstration of methods used in testing sprays for fly control; I. C. Brooks discussed the kinds, habitats, relation to disease and control of mosquitoes; Dr. R. M. Cable presented an able discussion on the relation and importance of Arthropods to disease; R. E. Herod of Toronto, Canada, gave an interesting story of the pest control operator under war conditions, and Martin Meyer presented a valuable talk on Disinfectants and Deodorants.

Tuesday afternoon was given over to the termite problem. Glen Lehker gave an illustrated lecture on the important points in the life history of subterranean termites, having a bearing on control. Dr. H. K. Steckel told how best to inspect buildings for termites, and R. A. St. George, termite specialist of the U. S. Bureau of Entomology and Plant Quarantine, gave a report on termite soil poison tests covering the past eight years. Following these discussions the conferees, under the direction of Walter Gibson, visited a termite infested home, which was the subject of a discussion that night.

In addition to a spirited discussion of procedures to handle the termite infestation inspected during the afternoon, the Conference was provided with a helpful discussion on types of construction and structural terms by K. H. Kettelhut, a prominent building contractor of Lafayette.

Wednesday morning the members of the Conference heard Wm. O.

PCOs and Entomologists attended the Sixth Annual PCO Conference held at Purdue University, Lafayette, Indiana, January 5-9.

Buettner discuss various industry problems, including research, public relations, priorities and national defense. Bert Lewis demonstrated the grinding and mixing of dry insecticides. W. E. McCauley discussed and demonstrated the application of insecticides as aerosols, and George Hockenyos gave valuable information on substitutes for priority chemicals.

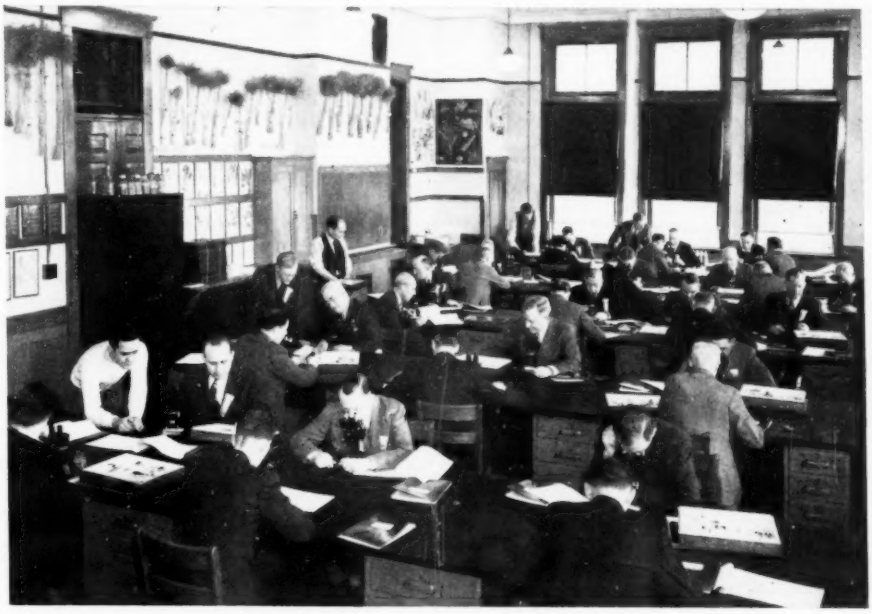
Wednesday afternoon was given over to fumigation problems. Dr. M. D. Farrar, of the Illinois Natural History Survey, discussed new developments in grain fumigation. Robert Laing presented a very complete outline of HCN fumigation procedure, and C. A. Vincent-Daviss and George Chapman discussed fumigation precautions. The lecture room program was followed by a HCN fumigation demonstration by C. O. Partlow, after which the members of the Conference proceeded to the Purdue Fieldhouse, where Dr. F. R. Eastwood discussed resuscitation practices and then gave all the members of the Conference an opportunity to personally apply the principles of resuscitation.

Wednesday evening the Conference had the privilege of seeing two marvelous colored moving films produced by H. J. Davies of San Francisco. Movies of the brown dog tick were shown and discussed by Dr. H. E. Whitmire. Frank J. Schneller, Jr., of the Wetzel Brothers Company, Milwaukee, Wisconsin, gave an interesting discussion on principles and policies of sound business promotion.

Thursday morning included a demonstration by Harold E. Jennings and W. R. Husen on oil bases and their effect on wallpaper. Doctor Deay provided a discussion of the insect and its environment.

The Thursday afternoon program included a discussion of wood-infesting insects, other than termites, by R. A. St. George, and wood-attacking fungi by C. L. Porter. Bert Lewis explained procedure in handling a federal housing project pest control by use of sprays. George Hockenyos demonstrated the use and value of rat and mouse glues and B. E. Montgomery explained procedures in controlling bees and wasps which invade dwellings.

One of the highlights of the Conference was the Annual Banquet Thursday evening. Dr. Edward C. Elliott, President of Purdue University, for the fifth year acted as toastmaster, thus assuring a successful and happy Conference climax. Comments were made by J. J. Davis, R. E. Herod, P. Calvert Cissel, R. A. St. George, W. P. Flint, and Wm. O. Buettner. The guest speaker of the evening was Dr. L. M. Sears, Professor of History of Purdue University, who gave a thrilling and impressive story of World Affairs. Telegrams and letters from many PCOs who could not attend were read. Of special interest was a message from George Elliott advising that Leonard Goldman of Providence, Rhode Island, who has attended four of the Purdue Conferences, had received instructions to report to Fort Bragg, North Carolina, as a reserve officer. He is perhaps the first PCO owner-operator to receive such a call. C. O. Partlow, Purdue graduate, a reserve officer and a PCO owner-operator of Lafayette, Indiana, has also been called to the service. Acting for the PCOs attending the Conference, Wm. O. Buettner presented President Elliott with $100.00 to add to the Pest Control Operators' Student Loan Fund.



PCOs classifying various insects at Purdue University.

—*Photograph through courtesy of C. A. Vincent-Daviss.*

Banquet scene at the Pest Control Conference at Purdue University. Among those in evidence are Prof. W. P. Flint, Calvert Cissell, President Elliott and Wm. O. Buettner.

Friday morning was given over to a variety of PCO problems, including carpet beetles, by Carl Weinman of the Illinois Natural History Survey, demonstration of a lint collector by Bert Lewis, and Cockroaches by George E. Gould. The afternoon was given over to miscellaneous personal problems.

Flies & Polio

One means by which infantile paralysis is spread far and wide has been discovered. The common house fly, according to top-flight Poliomyelitis Researcher Albert Bruce Sabin and Robert Ward of the University of Cincinnati, is a carrier of the disease.

In their report on polio made last fortnight in Science, they told how they and Yale experts John Rodman Paul and James Dowling Trask spent the summer catching flies, a summer job that may eventually help to bring poliomyelitis under control.

Last July and August, during polio outbreaks in rural Connecticut and Alabama, and in Cleveland and Atlanta, the doctors trapped thousands of flies in those parts. They mashed up the flies in sterile water or ether, gave it to monkeys in feedings, injections or nosedrops. Down came the monkeys with polio.

To the scientists' surprise, infected flies were found not only in insanitary places, but also in "a Government housing project consisting of modern, clean, thoroughly screened and hygienic homes. The community had "a special brick enclosure for the garbage cans, all of which were covered." In fact, Dr. Sabin noted, "there were so few flies about that it hardly seemed worthwhile to set out a trap.

Dr. Sabin suggested that these findings may clear up the old mystery of why polio comes in the summer. And they further substantiate earlier theories that the disease comes from eating infected food.

—*Time.*

2nd Eastern PCO Conference

EVEN conservative New Englanders, noted for understatement, can acclaim the 2nd Annual Eastern PCO Conference the "best ever."

The Conference was held at Massachusetts State College, Amherst, Mass., January 12, 13 and 14. The policy has been gradually to increase participation of the operators themselves in the program. Notwithstanding this, the Conference faculty included a distinguished list of scientists drawn from M. S. C., Cornell, M. I. T., and Harvard, the State Entomologists of New Hampshire and Connecticut, and an unusually strong representation from the Federal and State services.

Dr. C. P. Alexander, Head of the Entomology Department, was director of the Conference ably assisted by Prof. A. I. Bourne and members of the staff. Among those participating in the various sessions were: Dr. Charles E. Palm, Ithaca, New York; C. R. Fellers and A. S. Levine, Amherst, Massachusetts; Prof. C. T. Brues, Cambridge, Mass.; George E. Sanders, New York, N. Y.; Dr. R. B. Friend, New Haven, Connecticut; Dr. L. M. Ives, John F. Hanson, Dr. Marion E. Smith and Frank Shaw of Massachusetts State College; Prof. Chas. H. Blake, Cambridge, Mass.; Dr. M. B. McKenzie, Dr. H. L. Sweetman, and Dr. W. C. O'Kane, Durham, N. H.; Dr. T. R. Hansberry, Ithaca, N. Y.; Dr. George H. Chapman, New York, N. Y.; Walter Dykstra and Ernest M. Mills, of Fish and Wild Life Service, U. S. Dept. of Interior; George B. Lay, Boston, Massachusetts; F. E. Garlough, Washington, D. C.

Greetings of the National Pest Control Association were brought by P. Calvert Cissell, President, while from the pest control industry, Bartlett W. Eldredge, Joseph Finneman, Charles W. Houghton, F. E. Bohman and George R. Elliott presided over the several sessions.

The program was brilliant and well-balanced, and any attempt to summarize the material formally presented would be futile. Equally noteworthy, was the informal part—the "bull sessions," with their invaluable exchange of ideas, views, and helpful information. The theme-song naturally was the place of the PCO in the War. Evident above all else was a groping for the most useful way in which the pest control industry can devote its special talents to the national effort.

One oversight marred otherwise perfect arrangements. It had been necessary for the toastmaster, Bill Buettner, to make a brief stop at his Brooklyn home, on the fly from Purdue. Inadvertently, Helen neglected to replenish his travel wardrobe with pajamas, nightshirt, or any efficacious substitute therefor. By devious methods, the conferees succeeded in concealing the naked truth from the good folks of Amherst until banquet time, when the shortage was rectified. The toastmaster was presented with a native New England nightshirt, Cal. Coolidge model, complete with red flannel nightcap.

With the toastmaster properly costumed, the banquet was on. And what a banquet! Bill was at his supercolossal best. The principal speaker was President Hugh P. Baker of Massachusetts State College. Those in the "know" say that President Baker discarded a perfectly good prepared address, to put across a straight-from-the-shoulder talk, with a rich background of the speaker's experience as a trade organization executive. His message will not be forgotten by those who heard it; it might well be made a part of any trade association's by-laws. Bill appraised it accurately: "It rolled right down the center of the alley and knocked all ten pins for a loop."

PCOs who attended the Second Annual Eastern Pest Control Operators' Conference held at Massachusetts State College, Amherst, Mass., January 12-13-14.

Mice Keep School in Order

Glastonbury, Conn.—Several months ago two white mice named Major and Minor, weighing forty grams each, were given to a grammar school here. Daily the pupils fed Minor doughnuts, coffee, cake and candy, while Major got milk, cereal, fruit, eggs and whole wheat bread. So now Major weighs 268 grams and Minor less than one hundred. Not only, say the teachers, have Major and Minor provided a good object lesson, but there has been a lot less whispering and spit-ball chucking. Ill-behaved pupils are not allowed to feed the mice.

—*N. Y. Times.*

This Thief Was a Rat

Ring, Bank and Other Goods Found in Nest in Wall

Dallas, Tex.—First it was the baby's bank which disappeared from the W. A. Presley house.

A couple of days later Mrs. Presley's wedding ring and a diamond vanished. Presley called the police.

He called again—after he found the wedding ring, diamond, bank and various other articles in a rat's nest in the wall.

SUCCESS demands a steady flow of new ideas.

Phi Sigma Society
Alpha Omicron Chapter
Marquette University
Milwaukee, Wisconsin

January 8, 1942

Mr. Henry Turrie
Wil-Kil Company
512 West North Avenue
Milwaukee, Wisconsin

Dear Mr. Turrie:

Alpha Omicron chapter of Phi Sigma Biological Society at Marquette University wishes to express its sincere thanks for the most interesting film loaned to us through your kind courtesy. The film was entertaining, instructive, and brought forth many points for discussion including those of the highest regard for the Wil-Kil Company. We all feel that the success of your firm is a natural result of your excellent knowledge of the problems you face - Insect and Rodent Enemies of Man.

Many, many thanks.

Sincerely,
Ruth Dornfeld
Ruth Dornfeld
Corresponding secretary

(Note: The above is one of the many letters we have received after the film is shown.)

Keeping Up With the Changing Pest Control Industry

By J. J. DAVIS, *Purdue University*

IT WOULD seem timely, with the beginning of the 9th Annual Convention and since the Association is soon to start on its 10th year, to compare industry conditions today with those ten years ago, and as an interested on-looker, to evaluate the efforts of the National Pest Control Association and cooperating agencies.

In my opinion the development of modern pest control, the beginning of a new profession, began with the organization of the National Pest Control Association (then the National Association of Exterminators and Fumigators) in 1933. During the few years since, the organization has made an enviable record of progress. Just as a reminder we might mention some of their accomplishments. We think first of the fine Code of Ethics which is being accepted more and more each year; the Association has provided standards for termite control and good fumigation practices; has been largely responsible for better advertising practices; developed a wholesome cooperation between entomologists, biologists, chemists, public health officials and manufacturers; developed an appreciation in the minds of official Washington of the needs of the industry, as was done in connection with defense priorities and the Wages and Hour Law; and is now making notable progress in educating the public as to the importance of pests, and the service which Association members can provide, as evidenced by the recent publication of the booklet "Pests and People."

Looking back ten years, let us first compare the **service man** of today with his predecessor. Many may think of the salesman as the important cog in an organization, but we believe the service man is the one who shares the greatest responsibility, for while it may take a salesman to get a job, certainly it is the service man who is largely responsible for keeping the job. Looking back over the past decade and in talking with pest control operators, we see many definite trends toward the improvement of service, and this has been possible only by more efficient and intelligent service men. It is notable that operators are more careful in selecting men who are educated, possess good personalities, and who have home responsibilities. More and more we find service men are rejected or selected only after a period of apprenticeship during which time they are carefully schooled and watched. Many firms now have regular meetings with their men, where fundamental, technical and practical problems are discussed and demonstrated. Firms are also finding it profitable to financially reward length and efficiency of service, for they find that one dependable service man with satitsfying renumeration may easily provide a greater and more compensory service than two or three not so qualified.

From the viewpoint of the **customer** —we find the public is more pest conscious, is expecting more competent pest control, and incidentally asking more questions and perhaps more intelligent questions. Here are some of the more common questions asked:

What is it?
Where does it come from, and how did I get it, or what causes it?
What damage does it do?
What does it change into?
Can you control it?
Is your work guaranteed?
How fast do they breed?
What can we do to avoid them?
What is the cost?

These questions at once emphasize the necessity of a good understanding of insects and insect life, which is available through correspondence, publications, conventions, conferences and organized schooling.

Another phase of the pest control industry which is making progress is in the field of **advertising.** This subject is entirely too large for me to discuss thoroughly at this time and therefore I will simply quote a few statements I have received from representative operators which illustrate the trend. One operator writes: "We have advertised in trade papers, newspapers, telephone directories, etc., and do not believe these to be the most profitable. If the average exterminator would spend the same amount of money in rendering extra good service, new business would come to him." Another says, "We are using road signs, newspapers, telephone directory, and direct mail, but 60 per cent of our new business comes from satisfied customers." Still another says, "A satisfied customer is our best advertisement."

Of special significance is the concensus of opinion that telephone advertising in general is costly and unprofitable. We have many examples to bear out this statement. For example, in one city the firms mutually agreed to cut down on advertising in the telephone directory with an annual saving of $5,000.00 and with no loss in business. In this connection I would like to refer to a case record which is significant. The firm in question was paying $780.00 a year for telephone advertising. He used a telephone number which appeared only in the directory. A record was kept of all calls coming over that number and the gross return for the jobs received over that number, which cost $780.00, totaled $420.00 during the period of one year.

In connection with advertising, there is a definite trend toward that type which we may refer to as educational. Attractively mounted insect specimens are especially useful in giving a better understanding of the pest problems which are so often asked of operators. More and more operators are providing educational talks before service clubs and school groups. For these it has been found that specimens, slides and moving pictures are always helpful.

Another feature of the industry which has shown marked progress is the matter of maintaining **service or job records.** The pest control industry, like any other business, is recognizing the value of such records as providing an experience table from which one can base service changes, eliminate unprofitable accounts and unnecessary costs, and improve services. By proper classification of jobs, and utilization of the information these records contain, the firm can keep its name before past customers by periodical contact through letter, booklet or otherwise, and plan the

work of the year so as to keep employees profitably busy throughout the year. Observation would tend to show that accurate job records will sell a job in the face of price cutters, more effectively and surely than anything else.

What to me has been one of the major changes during the last decade is the close **contacts developed by commercial control operators with entomologists, biologists, and public health officials.** This development may be traced to the National Pest Control Association, which from the beginning has been fortunate in having leaders who recognized the value and need of educational features for their annual conventions, as well as practical and business features, and therefore called in technical workers to assist. Not only that, but the Association has been generous in inviting entomologists and others to attend their conventions, to the end that more attention is being given to much needed research, publications are recognizing the industry, and wholehearted cooperation has developed which is mutually beneficial. At this point may I urge commercial operators to critically study state and federal publications and offer suggestions for improvement which I am sure will be welcomed by authors. This increasing wholesome cooperation is being further reflected by the attitude of the public, for official entomologists and biologists are more and more asked for information on **where** they can obtain reliable service, rather than **how** can I control the pest.

It must be realized that for the most part, entomologists, biologists and public health officers are public officials whose first duty is to assist and protect the citizens. For this reason it may be expected that such officials will maintain close cooperative attitude with the industry, only so long as pest control operators provide a reliable service. In other words it is more important than ever before that commercial operators live up to the Code of Ethics of the Association and otherwise attend such meetings as provide factual data; an exchange of successful experiences and latest developments in the technique of application.

"Flour" Poisons 4, 1 Dead

PHILADELPHIA—One man died and three others were stricken seriously yesterday after eating anchovies which had been fried in a deadly roach poison mistaken for flour.

—*N. Y. World Telegram.*

New Insect Killers

After traveling 1,200 miles across wartorn southeastern China in the region of the Burma Road, Dr. Shin Foo Foon Chiu, a graduate of Cornell, and Sping Lin of Sun Yat-Sen University, gathered 76 insect-killing plants. About a dozen of these plants certainly have possibilities. In the opinion of Dr. Roy Hansberry of Cornell's Department of Entomology, one of them, Millettia pachycarpa, which bears seeds about as big as small walnuts and which can be harvested annually, is as good as rotenone dust, which is obtained from dried roots of the derris and cube plants and which is the most common organic insecticide in use today.

Another Chinese plant which seems attractive is a rhododendron with small yellow flowers from which an excellent insecticide, a poultry and livestock dip and a good fumigant can be made.

Dr. Shin Foo Foon Chiu and Sping Lin were guided in their search for plants by farmers and country herb doctors. To send the collection to the United States was no easy matter. The natives thought that the plant collectors were Japanese spies, for which reason no step could be taken without the sanction of the local authorities. Plants they collected were flown from the interior in Chinese army planes.

Sometimes the farmers and herb doctors flatly refused to give any information because they feared that the plants might be used as human poisons, in which case the blame would fall on them. Lastly, superstition had to be overcome; for in some localities the natives will not kill anything, whether it be an insect or a four-footed animal.

—*N. Y. Times.*

American Fluoride Corporation

151 WEST 19TH STREET, NEW YORK, N. Y.

Quality goods in convenient packages at strictly market prices.

ARSENIC PURE POWDER
5-10-25 and 112 Lb. Cases

ARSENITE & ARSENATE OF SODIUM
C.P. & Commercial—1-100 Lbs.

BEDBUG KILLER—Famous BBK
1 and 5 Gallons

CARBOLIC ACID, Highest Purity
Crystal or Liquid—1 to 50 Lbs.

CRESYLIC ACID PALE
1 & 5 Gallon Cans

DERRIS POWDER
5-50 Lbs.

DERRIS RESIN
1-25 Lbs.

DERRIS EXTRACT
1-5 Gals.

FLUOREX V, White or Blue
5-100 Lbs.

FLUO-PYRE
5-100 Lbs.

FLUOREX INSECT SPRAY
1-5 Gallons

FLUOREX CATTLE SPRAY
1-5 Gallons

PHOSPHORUS PASTE
1-5-25 Lbs.

PHOSPHIDE OF ZINC
1-5 Lbs.

POISON SEED FOR MICE
5-100 Lbs.

POISON SEED FOR RATS
5-100 Lbs.

PYRETHRUM TESTED POWDER
5-10-25-100 Lbs.

PYRETHRUM EXTRACT Nos. 5 & 20
1-5-30-50 Gallons

GENUINE IMPORTED RED SQUILL
1-5-25-100 Lb. Cases

GENUINE RED SQUILL FLUID EXTRACT
Quarts, Gallons and 5 Gallons

ROTENONE—ROTENONE SOLUTION
Oz. & Lbs. - Pints & Gallons

RUMETAN
1-5 Lbs.

STERILAN Dependable Mothproofer
5-25-100 Lbs. (Booklet)

THALLIUM SULPHATE
1 & 2½ Lbs.

THALLIUM PASTE FOR ANTS
1 Lb. Jars

A.F.C. ANT POWDER
Dozen Cases

A.F.C. FLEA POWDER
Dozen Cases

POWDER BLOWERS, SPRAYERS, DUSTERS, RESPIRATORS, FACE MASKS, GOGGLES, SEALING TAPE

Anything used by Pest Controllers we will endeavor to supply at strictly market prices.

The Black Carpenter Ant

By R. B. FRIEND, *The Connecticut Agricultural Experiment Station, New Haven, Connecticut*

EDITOR'S NOTE: *Dr. Roger B. Friend, State Entomologist of Connecticut, read the following paper at the Second Annual Eastern Pest Control Operators' Conference at Massachusetts State College, Amherst, Mass., January 12th.*

THE black carpenter ant is not only like many other species of ants, a nuisance in dwellings, but its nesting habits make it injurious to structural timber. Normally an inhabitant of woodlands, where it makes its home in standing and fallen trees, it is quite common in suburban and rural areas and even in the center of small towns where trees and shrubs grow on the ground about buildings.

Ants live in colonies, which are composed of groups of individuals called castes. In a carpenter ant colony there are two distinct groups, workers and reproductives, aside from immature individuals. The workers are not all alike, some being larger than others, nor are the relative numbers of larger and smaller individuals constant throughout the life of the colony. There are, at least at certain times, two types of reproductive adults present, the dealated queen which founded the colony and winged males and females, progeny of the queen, which will disperse from the colony during the flight season.

The ant colony is a physiological unit which has its stages of development and maturity. The adult ants fly and mate in the late spring. After mating, the male dies and the fertilized female seeks a place to start a colony. In woodlands this is usually under the bark of a stump or tree or in a knot-hole or decayed spot. In structural timbers and poles the colony originates in some defect, and places where the wood is moist may be favored. During the first season the queen lays a few eggs and rears a few small workers, perhaps 15 or 20. The extent of excavation in the wood during this period is negligible.

For a few years the colony increases rapidly in size and the excavation of galleries in the wood proceeds correspondingly. The increase in workers increases the food supplied to the brood, and the workers produced increase in number and size. According to Pricer in from 3 to 6 years after founding the number of workers reaches 2,000 to 2,500, and winged males and females are produced. The colony is then mature. It is doubtful that there is much, if any, increase in numbers thereafter, for the annual production of winged adults, which contribute nothing to the colony, dissipates the energy of the latter. A certain amount of excavation continues, however, for an indefinite period.

The structure and size of the ant galleries in wood deserve some attention. In making their galleries, the ants tend to completely excavate decayed wood but in sound wood they follow the contour of the annual rings and tend to leave thin layers intact. The final result of this is the formation of a cavity of typically three parts. There is a central large section, completely hollowed out and surrounded by peripheral small cavities saparated by thin laminae of wood. At one or both ends of this is a zone of small cavities separated by thin laminae. From this zone there extend narrow galleries which presumably represent a region of active excavation. The members of the colony are usually found in the periphery of the central section and in the cavities of the laminated and distal sections.

The only available estimates of the size of ant cavities refer to those in trees and poles. Graham found that in white cedar trees in Minnesota the cavities usually did not extend above 6 feet from the ground and the ants were responsible for a loss of 2 feet, on the average, from the butt of the living tree, in addition to the loss caused by heart rot. These trees had been infested an unknown length of time. In Connecticut the length of the cavities was determined in 35 infested telephone poles. The central main cavity (and the peripheral laminated zone) was found to be 2 to 4 feet in length in most cases, but small galleries leading from this main cavity might in rare cases be over 20 feet in length.

The cavities in posts and poles weaken them, often just above the ground line, that is, at the place of greatest stress. The strength of the infested pole depends on the thickness of sound wood around the ant cavity. Generally speaking, a telephone pole should have a sound shell at least two inches thick in order to be strong enough to remain in use. A hollow chestnut pole 20 inches in circumference with a sound shell two inches in minimum thickness is as strong as a solid pole 19 inches in circumference, and if the sound shell is 2.5 inches in thickness, the hollow pole is equivalent to a solid pole. If the hollow pole is 40 inches in circumference and has a sound shell 2 inches in minimum thickness, it is equivalent to a solid pole 36 inches in circumference, and if the sound shell is 5 inches in thickness, it is equivalent to a solid pole.

In buildings the nests of carpenter ants may occur in almost any location, but porch pillars, and beams under the eaves are favored places. We have found excavations in timbers 30 feet above the ground, but almost always in the outside wall. Apparently the colony frequently establishes itself in decayed spots in house timbers. The presence of fine sawdust-like material is an indication that ants are nesting nearby. This is ejected from the nests, and if the colony is active, more "sawdust" will replace that swept up. Usually the texture of the "sawdust" and the admixture with it of fragments of insects (including ants) are excellent evidence. Very few ants may be seen around the house, even when there is a nest in the timbers. These insects are more active at night than during the day, and the majority of foraging workers may not go into the rooms of the house.

The presence of carpenter ants in the house is not conclusive evidence that the ants are nesting in the timbers of the building. Quite frequently they come in from a tree outside and a colony may exist in firewood stored in the cellar. An examination of the ground around the house may reveal clear-cut paths, up to one inch in diameter, across the lawn from the tree to the house or towards it.

The foraging habits of these insects is important in relation to control. Carpenter ants are trail-making foragers. If a source of food exists in the vicinity, the workers concentrate on that source. The ants are fond of sweet material, as sugar and

(Continued on page 14)

Eulogy to a Bug Man

By HAZEL WATKINS LAIRD

This is the fourth of a series of five articles prepared by Mrs. Laird, A & M Termite Co., Stillwater, Okla., for PESTS, the three previous ones having appeared in November, December and January issues. She designed the articles to make the public chuckle, to educate it through the conversations of insects, thereby creating good will and enlarged opportunities for pest control sales. PCOs may, if they wish, reprint any or all of the articles for use in their own promotional effort, or submit them for reprint to their local newspaper, provided credit line is given Hazel Watkins Laird, as author, and PESTS, as publication source.—EDITOR.

HAS anybody seen my husband? He was last noticed crawling under an address on Duck Street going east where he was called to make a termite inspection. He did not return home. He may have decided to stay under that house to keep out of work if he had thought he could have gotten away with it, for ever since that warm day in May when the termites started swarming they have really kept him going around in circles. Personally I am afraid they have ganged up on him underneath some house, and have robbed him of his flash lights and fighting paraphernalia. Maybe the poor man cannot find his way out, or the termites may have eaten his clothes.

He was a good man, too. Everybody surely did like my husband. That is everybody except the bugs. Why it got so that whenever anybody in town would see a little ant, a silverfish, a roach, a spider, a flea or a mosquito, they would call him on the telephone and ask him to come right on out to the house **quickly.** He appreciated the business too, because that was the way he earned our bread and butter by going out and killing other peoples' bugs. But it was the termite situation that really got him going this spring.

You know that's a funny thing. People don't see what danger they are in until the floors of their houses practically fall through. And I'll bet the little termites just laugh and laugh because they know all the time they can eat all winter long and the people will not catch them. But comes the spring, and the termites swarm. Phew, the people all want something done at the same time. Now that's too bad, because so many people wanted so many bugs killed this spring was the reason my husband met his fate. He tried to get to as many houses as he could, but it was impossible to be everywhere at the same time. If he could have killed more of the termites during the winter months, I do not believe they would have caught on to what he was doing. But with him waging such violent war on them these past few weeks, it is no wonder the termites decided to try to get even.

Everybody will surely miss my husband. Many poor little children will have to be bitten by mosquitoes and flies this summer. Many lovely lawn parties will be ruined this summer because he has not dusted the grass for fleas. A lot of people will probably starve because the roaches will get away with their food. Many will not get to enjoy the cool water because the moths might have eaten their bathing suits. Then this winter when it is cold again many will have to stay out in the rain because the termites may have eaten their homes.

Oh I do hope that my husband may be found. I was sometimes aggravated with him, for instance when he used my jelly jars to preserve specimen or swiped my tablespoons to measure his flourides. But he will be hard to replace. Besides the bugs are getting pretty bad around here. If he is found wandering around under the premises of some house, do not be concerned about the expression he may have on his face. He is really quite sane. That look has been there ever since he went into the bug business seven years ago.

Facts that are not frankly faced have a habit of stabbing us in the back. —*Sir Harold Bowden.*

The base you choose for your insecticide has a lot to do with its Sales Appeal. For example, Penn-Drake INSECTI-SOL, being permanently odorless, 100% volatile, and absolutely PURE enables you to make your product most effective and appealing to the trade. Samples examined after 22 months were still water white and odorless. INSECTI-SOL contains nothing to stain or soil clothing, drapes, rugs, etc.; it enables insecticides to float longer and penetrate further; it is 100% volatile—yet does not evaporate before maximum toxic effect is reached.

And the perfect base for mothcides is Penn-Drake Deodorized Naphtha

penn drake petroleum products

For full information write Dept. 108.

PENNSYLVANIA REFINING CO.
GENERAL OFFICES · BUTLER, PA.
Refineries at Karns City and Titusville, Pa.
Makers of
White Oil, Technical Oil, Petrolatum, Petroleum Sulphonates, etc.

the secretions of aphids, and they also feed on dead insects. How long a colony can survive in the active season without food is not known. A beheaded worker ant has been kept alive 41 days, and it walked two days before it died.

There is little excuse for confusing a carpenter ant infestation with that of termites. The insects themselves do not look alike. The termite worker is white in color, has beaded antennae, and is broad-waisted. The carpenter ant worker is black in color, has geniculate antennae, and is narrow-waisted, having the abdomen made up of a petiole and a gaster. The termites live on cellulose and do not seek sweet food. The walls of their tunnels usually contain clay-like material. Since they eat wood, they do not leave any "sawdust" as evidence of their presence. Carpenter ants do not eat cellulose, and do not use wood as food. The walls of their galleries do not contain clay-like material but are always clean. They eject the excavated wood from the nest in the form of coarse "sawdust."

The control of carpenter ants, which means the extermination of the colony, may be attained by use of either a fumigant, a contact insecticide, or a stomach poison. The difficulties of using fumigants against these insects in houses need not be stressed here. Some years ago we had occasion to investigate the carpenter ant as a pest of telephone poles in Connecticut. Infested poles make ideal experimental material because they can be cut open after treatment and the condition of the colony determined. In order to eliminate the colony, which can be exactly located in the pole by tapping with the blunt side of an axe, various fumigants were injected into the galleries, the hole used for injection being plugged with a dowel. Some of the early trials were made with a solution of paradichlorobenzene in gasoline and in carbon disulfide, a solution of naphthalene in carbon disulfide, pure carbon disulfide, and calcium cyanide ("Cyanogas A," 40-50 per cent calcium cyanide). None of these proved effective, probably due to the ramification of galleries and the checks and holes in the posts. As baits, neither sodium arsenite and honey, nor tartar emetic and honey, nor a commercial ant poison containing .18 per cent sodium arsenite were effective.

The next group of infested poles were treated with orthodichlorobenzene, decahydroaphthalene, steam-distilled pine oil, and various kinds of creosote. The creosotes were most promising. One of these mixtures, consisting of equal parts ordinary wood-preservers' coal tar creosote and "refined" creosote (85 per cent gasoline by analysis) was very effective. All ants in the galleries of most of the poles treated with this were found to be killed when the pole was cut open. In view of the high gasoline content of the "refined" creosote in this mixture, another mixture was made up of equal parts coal tar creosote and gasoline. This was injected into the top of the ant galleries, about one pint per pole, and was uniformly successful in exterminating the colonies. This mixture undoubtedly possesses the properties of a fumigant, contact insecticide, and repellent. It may also arrest decay. In poles it proved an ideal insecticide, cheap, easy to apply, and effective in the hands of a skilled operator. In dwelling houses it has too many obvious faults.

In eliminating the ant colonies from dwellings excellent results have been attained by using a poison paste containing thallium sulfate. When properly applied this has never failed us. Repeated baiting may be necessary, as the entire colony must be destroyed. The ants like it and take it back to the nest. It is, of course, very poisonous to man and to domesticated animals, so should be handled with care. However, with proper precautions there is no danger.

Recently rotenone-containing insecticides have become widely used against a number of pests. Ground derris root, used pure, is very toxic to ants, bees, and wasps. Downes, in British Columbia, has the following to say regarding its effectiveness against carpenter ants: "No matter where the nest is situated or how extensive the infestation, if the powder can be placed where the ants must walk through it and thus get some of it on their bodies the colony can be exterminated rapidly." He found that light infestations would disappear in two or three days and states that the treatment never fails in houses. Our own success with this against the mound-building ants, and some results secured last fall against carpenter ants substantiate Downes' results.

On October 1st a series of infested telephone poles was treated with ground derris root (approximately 4.5 per cent rotenone). The powder was blown into the top of the ant galleries with a dust gun, 24 grams per hole in most cases, and the hole plugged with a dowel. Four treated poles were cut open in December. In one pole a thriving colony was found, in two poles some ants were still alive, although many had been killed, and in one pole all the ants were dead. The failure to eliminate the colonies in three poles was attributed to improper application of the dust, as the distribution in the galleries appeared poor. Whether or not efficient application can be made to colonies in telephone poles is a question to be decided later. The pole with the thriving colony had galleries containing ants five feet below the ground line. However, the derris certainly killed ants, and in a house a better application should be possible. Derris has the distinct advantage of being practically non-toxic to man in any reasonable quantities.

References Cited:

Downs, W., 1939—"Derris for Ants and Wasps." Jour. Ec. Ent. 32: 883-884.

Friend, R. B., and A. B. Carlson, 1937—"The Control of Carpenter Ants in Telephone Poles." Conn. Agr. Expt. Sta. Bull. 403.

Graham, S. A., 1918—"The Carpenter Ant as a Destroyer of Sound Wood." 17th Rept. of the State Entomologist of Minnesota: 32-40.

Pricer, J. L., 1908—"The Life History of the Carpenter Ant." Biol. Bull. 14: 177-217.

EAA Quiz Questions

Following are a few of the questions used in the quiz program held by Engineering Advertisers Association, Chicago, last month which we believe will prove of interest to PCOs. Answers will be found on page 33.

1. Does the effectiveness of an advertisement usually increase in direct proportion to its size?

2. Can advertising of a purely competitive nature be considered an economic waste?

3. Have negative headlines in ads almost invariably proved unsuccessful?

4. What is the most legible of all color combinations?

5. If you wish to protect an advertising idea, can you do so by mailing a copy of the plan to yourself via registered mail?

6. Would you order a line plate with intricate details made on copper or zinc? Why?

That Cricket on the Hearth

The time is now upon us when
The sentimentalists again
Dust off the sweet, endearing phrase
To sing the little cricket's praise.
The cricket, that persistent beast,
Which settles down where wanted least
To scratch his toenail on his wing
And make believe that he can sing.
The cricket, there beside the fire,
Who twangs upon a tuneless lyre,
Who simply sits and stridulates
The while he loudly cogitates.
Go sing his praises, you who will;
In me he fails to rouse one thrill.
In fact, he makes my hackles twitch—
He's just a cockroach with an itch.

—HAL BORLAND.
—New York Times.

Exterminator Tells F. D. R. How To Eliminate "Rats"

Think of the Japs as rats, Johnson E. Gaskins of 1722 Sixth St. NW., Washington, D. C., advised President Roosevelt today, and then—well, just exterminate them.

The donor of this advice was not indulging in mere expletive against the tricky Nipponese. He has considerable respect for rodents because for 20 years he has been making a living exterminating them.

From his experience in outwitting and then blitzing the unpleasant little animals, Mr. Gaskins, a successful business man with 10 employees and the rat exterminator's equivalent of a carriage trade, offered the following U. S. strategy:

"Don't fight the Japanese, Mr. President. If everybody keeps saying why don't you do something, tell them to keep quiet. Find out what the Japs feed on. Maybe its thinking that they are winning a lot of victories.

Put Out The Bait

"Let them have a lot of little victories. Let them think they are outsmarting you. Maybe let them have Manilla or Luzon. We can always take it back. Put out the bait. Get them all out in the open. Then come up behind and close off their holes. When I do that I can take my time about shooting them off."

As one exterminator to another, Mr. Gaskins said he thought Secretary Hull was overhopeful in expecting the Japanese to give advance notice of their plan to attack us and a trifle foolish to get moralistic about their treachery.

"What did he expect them to do? Say, now, Mr. Hull, we hereby notify you that on Sunday morning at such and such a time we are going to attack you. Please, Honorable Sir, release our ambassador, Mr. Hootchie Kootchie."

Should Have Paused

Mr. Gaskins also said he thought the United States should have stopped to wonder, before the blow fell, why such an apparently insignificant little country as Japan should bluster so mightily before two heavyweights like the United States and Britain.

Getting out of character as an exterminator for a moment, and assuming a U-st perspective, Mr. Gaskins said he thought Secretary Hull "should have felt that other fellow out to see if he had a razor in his pocket."

For the future, he advised a policy of quiet feeling out in the Pacific, which, after all, is the ocean the Japanese know best. "When I go into a new place I don't start swinging. I figure the rats know more about the layout than I do.

—*The Washington Daily News.*

Looks like Mr. Gaskins has something here.—EDITOR.

Nazi Bug Killer Shuts Red Embassy

Berlin—This huge sign was tacked up on a white cloth that covered the whole front of the Soviet Embassy building:

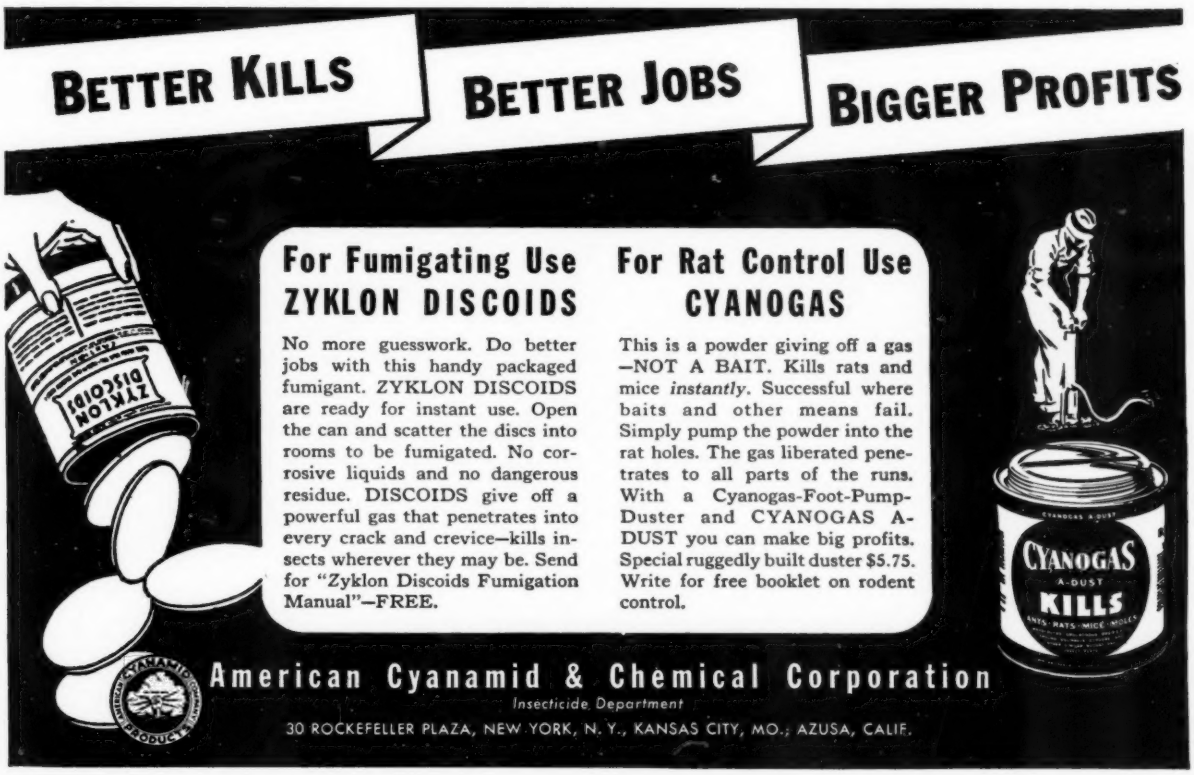
"Beware! Danger to life! Closed!

"This whole building is under gas.

"Unauthorized standing in front of building strictly forbidden!

"Erich Hartmann, licensed bug exterminator under state concession."

A man's reputation is a blend of what his friends, enemies and acquaintances say behind his back.


BETTER KILLS
BETTER JOBS
BIGGER PROFITS
For Fumigating Use
ZYKLON DISCOIDS
No more guesswork. Do better jobs with this handy packaged fumigant. ZYKLON DISCOIDS are ready for instant use. Open the can and scatter the discs into rooms to be fumigated. No corrosive liquids and no dangerous residue. DISCOIDS give off a powerful gas that penetrates into every crack and crevice—kills insects wherever they may be. Send for "Zyklon Discoids Fumigation Manual"—FREE.
For Rat Control Use
CYANOGAS
This is a powder giving off a gas —NOT A BAIT. Kills rats and mice *instantly*. Successful where baits and other means fail. Simply pump the powder into the rat holes. The gas liberated penetrates to all parts of the runs. With a Cyanogas-Foot-Pump-Duster and CYANOGAS A-DUST you can make big profits. Special ruggedly built duster $5.75. Write for free booklet on rodent control.
CYANOGAS
A-DUST
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Hitler's Ace Agent

By LUDWIG CAMINITA, JR.

IF NAZI spys in the United States are as alert as they are reputed to be, Berlin undoubtedly has a file marked "Rats, American." There may even be the following statement appended: "The Nazi's best agent in America."

When an animal can sabotage factories, destroy food, spread disease, and insidiously and effectively gum up the National Defense effort, gum it up $189,000,000 worth, he's as good as any rat—human or animal—Hitler ever hired.

With $189,000,000, we could buy any one of the following items: 3 battleships; 6 aircraft carriers; 9 light cruisers; 750 4-engine bombers; 3,780 light tanks; or 37,800 training planes. Take your choice.

Human beings are illogical creatures. Tell the public that a dozen kids in China are starving or that a city in England needs funds to repair damages from Nazi bombs, and big-hearted Mr. and Mrs. John Citizen dig into their trousers and purses to help the poor people overseas. Tell them to do something about the rats that spread disease and that damage millions of dollars of food and supplies destined for "the poor people overseas" and Mr. and Mrs. John Citizen ignore the advice—until something happens.

Public Health authorities for years have been trying to educate the American public to the fact that rats are dangerous because they spread disease. No action. But when 12 western states were threatened with bubonic plague last year, Mr. and Mrs. really hopped. They wanted action—and right away.

As soon as the newspapers stopped writing about the threat of bubonic plague, the public became apathetic. As though the situation were corrected that easily. Fortunately, the U. S. Public Health Serivce is not lulled by a false sense of security. It is still vigorously investigating the potential scourge.

Lack of adequate publicity seems to be an important factor in this widespread disinterest for continued, concerted warfare on rats. Constant education will be necessary before the lady in the suburbs and the owner of the warehouse will call a professional exterminator to make periodic examinations in the home or business house.

Farmers have been warned for years by Fish and Wildlife Service rodent-control workers that unless barns, chicken houses, and homes are rat-proofed, losses in spoiled grain, damaged bins, and killed poultry will be terrific. But most of the farmers take few adequate precautions against rats.

One rat killed 183 chickens in a few nights on a poultry farm near Ogden, Utah, last year. A Connecticut farmer lost 150 one-day-old chicks in one night when rats made a wholesale raid. Both farmers probably took rat-control measurer immediately. It is doubtful that many of their neighbors did.

The cry for food and more food comes from England, but American farmers apparently are still content to lose some $63,000,000 each year to rats that eat grains, kill poultry, rob eggs, and eat the germ of the corn kernel and planted seeds.

Rat-control campaigns are conducted by Fish and Wildlife Service officials with the hope that Americans will become rat-control conscious. Last year, 104,300 premises were treated in cooperative campaigns conducted throughout the country. Premises included private homes, farms, factories, and institutions. But however valuable that work is, it is only a feeble beginning when one remembers that there are about 130,000,000 persons in the United States and 123,000,000 rats.

It remains for the professional exterminators to "follow up" these cooperative Federal-City or County campaigns.

Biggest problem now facing both public and private rat-control workers is the restricted supply of red squill. The war on little rats has been affected by the war begun by big rats.

Red squill comes from the Mediterranean countries. Only ships carrying foods, munitions, and other immediately essential supplies are willing to ply through the waters of Mare Nostrum. But there is hope. War often produces new industries. Red squill may soon be raised in the United States.

To meet the shortage of red squill, Fish and Wildlife Service scientists developed a method for the practical fortification of low-grade red squill. Now, in cooperation with the Bureau of Plant Industry, United States Department of Agriculture, the Service is attempting to determine whether squill can be farmed here commercially.

Despite the advances that have been made in rat-control techniques, the rat problem is becoming, if anything, worse. In many areas the influx of "defense" workers from rural to urban districts has made the rat problem acute. The suddenly overtaxed refuse-collection and garbage-disposal facilities in cities cannot meet the emergency adequately. Trash and garbage accumulate, and rats thrive.

When one realizes that controlling these noxious animals is comparatively simple one wonders what has happened to the much vaunted American efficiency. A few million dollars annually would do the trick. It would seem businesslike to spend, say $5,000,000 a year to save $75 to $80,000,00.

City, town, and county administrations might well take their cue from western stockmen.

One of the biggest problems facing officials of the Fish and Wildlife Service is the control of coyotes, prairie dogs, and other predatory animals and injurious rodents playing havoc with livestock in the West. After years of losing an aggregate of millions of dollars annually, the western ranchers took measures to reduce their losses.

At first, control seemed useless. The ranchers continued to lose a large proportion of their sheep and cattle. Then the Service experts showed them what was wrong: Control efforts were sporadic and unorganized.

Today, control of predatory mammals in the West is a highly organized affair. Losses have decreased. Stockmen find the work worthwhile enough to pay hard-earned cash for it.

Last year, States cooperating with the Fish and Wildlife Service contributed over $475,000 for control operations. Cooperating counties, livestock associations, and others added

another $1,085,000. In the slanguage of today, "that ain't hay."

If city folks and farmers learned a lesson from the livestock men and contributed a few pennies, figuratively speaking, for rat control work, they'd reap dollars' worth of profits in the form of health, conserved crops, protected foodstuffs, and undamaged store goods.

The rat is still Hitler's ace agent. Until Americans work up enough interest to pay for and conduct regular, organized rat campaigns, the little fellow with the big mustache will remain the best saboteur in the employ of the big chap with the little mustache.

Quotation for the Month

It is not enough to be busy: so are the ants. The question is: What are we busy about?

—Thoreau.

Pest Control in the News

MICE

QUESTION—Our summer house at the shore is overrun with mice. At present we use the house only on Sundays. There are signs that they are in the house at all times. How can we get rid of them and avoid damage to furniture and clothes?—R. L. R., New York.

ANSWER—Several pounds of moth balls scattered all through the house as the last move in closing should get rid of the pests. They hate the smell. You can then keep them from coming back by closing the holes through which they are now entering. For this, insect screening should serve.

TERMITE SHIELDS

QUESTION—The foundations are topped with copper for termite protection. Is there any danger in having wood studs cross this and connect with the beams and floor above? —R. J. V.

ANSWER — For complete protection against termites the furring should not come in contact with the copper shield, neither should it connect with the floor joists above. Where furring strips are in direct contact with concrete, avoid connecting them with the wood structure of the house. You can get detailed information from the Copper & Brass Research Association, 420 Lexington Avenue, New York.

SQUIRRELS

QUESTION—Squirrels get into the roof of a house through an opening next to a stone chimney, and under a copper gutter. How can I get rid of them? P. W. R., Flushing.

ANSWER—On a bright day when the squirrels are out hunting food, pour a pound or two of moth balls into the hole.

—Roger B. Whitman's Column, N. Y. Sun.

Burns Are Fatal

Buffalo—Mrs. Clara Fitzgibbon, 40, died December 18 of burns suffered December 10 when a can of exterminating fluid exploded and ignited her clothes.

—N. Y. World Telegram.

FUMIGATING FOLLIES *you'll want to avoid...*

WHY RISK DAMAGING THE FINISH with a tape that may peel off the paint—when you can get PERMACEL—THE EFFICIENT FUMIGATING TAPE that seals joints extra-tight—and strips off clean.

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Thermal Preference by Pharaoh's Ant As a Guide in Control Work*

By J. E. ARMAND, *Plant Protection Division, Toronto*

LAST year, while watching control operations being carried out by a commercial insect exterminator, an opportunity was granted to note some of the interesting habits of Pharaoh's ant and this insect's preference for a certain range of temperature. While the marching habits of the insect, the importance of trying to locate the nests, and the application of certain poisons are known, the observing of a thermal preference will apparently clear up mysteries, up to the present time not understood, and serve as a guide for more effective control.

The commercial exterminator had appealed to the Department for assistance in eradicating this particular outbreak in view of the fact that several other exterminators had attempted to control the infestation without success. The outbreak occurred in a two-story building consisting of apartments and stores, with separate basements.

Inquiries of tenants resulted in conflicting answers being given regarding the preference of this ant for certain types of food, its habits, and prevalence at different seasons. The different statements with regard to food preferences were cleared by noting that the tenants stored the food in various ways, and this also explained the variation in the habits of the insects, as certain tenants stored no foods and, therefore, did not observe any regular trails to and from a supply of food. This, however, did not explain the mystery of the prevalence or absence of the ants at different seasons of the year. As an example: at a drug store at the corner of the building, the insects were reported as abundant in the summer and absent in cold weather; whereas at a hat shop at an extreme end of one wing of the building, winter abundance only occurred. Midway between these two stores there is a tailor shop where the insect was reported as being abundant throughout the year. A number of other instances might also be cited.

*Contribution No. 27, Plant Protection Division, Department of Agriculture.

In the hat shop a trail was followed with a pencil and found to be clear cut and without deviation. This followed a perpendicular hot water pipe within the wall which warmed the plaster. The insects were found to follow the warm area but not in the center directly over the pipe where it was very warm; it was rather to one side where the temperature was more moderate. The trail proceeded in a vertical line from the baseboard to a hole in the plaster near the ceiling and had just one branch to a nearby sink which some ants visited briefly.

In the basement of the tailor shop there was a very hot pipe. The trail in the tailor's basement was interrupted by a stationary wash tub which the ants visited for moisture and then returned to continue the trail along the drain pipe, through a hole in the wall into the boiler room where the temperature was very high. It then proceeded into a hole in the concrete floor. At this point the insect traffic was sufficiently high to suggest the presence of a nest beneath the floor. The temperature in the boiler room was extremely high, and no wall trails were seen. On the other hand the coal room adjoining had a lower temperature, but was still quite warm and trails were present on the wall close to the boiler room. All parts of this wall were warm and trails could be marked out like tributaries of a river. These were the only examples of trails other than horizontal and vertical ones which were noted during our observations.

From this information it appeared that the heating system in the buildings may prove to be reliable guides to the presence of trails. In no instance were ants seen to travel directly on hot pipes, but preferred trails close by with a moderate temperature. One hot pipe passed through a basement room which is very cold in winter and none of the tenants served by this pipe were annoyed by ants during the winter weather. Apparently the ants would not travel over the pipe, and the walls were not warm enough during the winter months. In summer, however, when the wall became warm, the insects would resume their march.

These observations were confirmed in another apartment building being treated by the same exterminator. Two large unfinished spaces were beneath the building. These contained heaps of earth which was wet in low places. These spaces were kept closed and the atmosphere was uncomfortably hot. Each had two walls adjacent to the outside earth which were cool and appeared to have no trails. Walls in the middle of the building were warmer and bore trails. The fourth wall in one room was adjacent to the boiler room, and bore three horizontal trails with a number of vertical tributaries to the apartments in the building and also to the earth.

An explanation for the horizontal trails at varying levels might be that the temperature in these spaces varies with the amount of firing of the boilers. In cold weather, when there is extra firing, the ants might be more comfortable at a lower trail. On one mild day it was observed that all the trails were active. The temperature on this day at the highest horizontal trail was 82°F. and 80°F. at the lower. The temperature at the soil level at the foot of the wall was 78°. The temperature in the middle of the space was 84°. A telephone ground wire which extended from the wall across two beams bore a trail as far as the first beam, from whence it led along the beam to the wall. Directly beneath this right-angled trail was a right-angled hot water pipe, the temperature at the wire being 86°F.

The temperature in the second space although warm, was lower. The fourth wall was adjacent to the locker room on which two horizontal trunk lines with vertical tributaries were noted. One nest was found amongst the brick construction midway along the wall where the temperature was 82°F. and two other nests on the top of the wall where the temperature was nearly 86°F.

From the above observations the following conclusions have been drawn:

1. In establishing nesting places

and in traveling in search of food, the Pharaoh's ant requires a high degree of temperature.

2. They depart from main trails only for short periods to obtain food and moisture indicating a reluctance to be away from heated surfaces.

3. Preferred temperatures appear to be between 80° and 86°F.

4. In all cases the restricted trails in rooms of normal temperature were in strong contrast to the multiple trails noted in rooms of high temperature.

5. That trails leading to earth do not necessarily indicate the presence of a nest. Such earth may provide the required moisture only.

6. It is evident that abundant moisture supply is essential to an ant colony.

7. Sources of infestation are most readily determined by concentrating on the examination of areas adjoining heating systems.

———•———

Advertising must. or should be to business what the balance wheel is to the engine. If properly used, it can be a reliable factor in stabilizing the peaks and depressions of business.—*Printers' Ink.*

In a Lower Vein

Excuse, while we do a little gutter wallowing:

When is an efficiency apartment not an efficiency apartment?

Ans.: When it is a little buggy.

Garbage by any other name would smell as bad, and an incinerator isn't a storehouse.

A highfalutin name over the door only emphasizes neglect within.

"Wait 'till you see my smoke" is the motto of too many firemen—professional and amateur alike.

Ants in the pants or pantry, highly annoying.

Varment or varmint, "dialect of vermin," noxious they sound, noxious they are—a hurry up call for the exterminator. An exterminator in time is sublime.

—*The Apartment News.*

———•———

Boring From Within

AUSTIN, Texas—Scientists are breeding a new kind of bug they expect to exterminate the boll weevil and pink boll worm, destroyers of millions of dollars worth of growing cotton. The bug warrior is called microbracon. It is a parasite which destroys the weevil and worm by boring into their lairs.

—*N. Y. World Telegram.*

Wake Up Your Mind

"The fatigued mind is the timid mind," says Henry Kendall, an industrial engineer. Timid minds mark time. They are afraid to try. They dodge work. They hold back. They are a liability to any business.

It is the vigorous mind that tackles difficult tasks with gusto. When you've lost zest and punch, check up on your mind. Is it fatigued, tired, in the dumps?

Wake up your mind by getting away from the daily grind. Take a vacation. See new things. Think new thoughts. Meet new people. If your mind has become a dull tool, a vacation will sharpen it again to a keen sharp edge that will enable you to hew your way to new achievements.

Wake up your mind by reading a stimulating book. An inspiring book often will lift you out of your mental rut and give you new vim and courage. Invigorate your mind with the written thoughts of vigorous thinkers.

Wake up your mind by forgetting your mind. Have a hobby. Play with the children. Dig in the garden. Swim, fish or sail. You'll return to your work with a mind rejuvenated.

Fatigued minds cannot build a business, increase the sales-volume or develop new products. Such work is for rested, keen, dynamic, daring minds. That's why time spent in tuning up our minds is time well spent.

———•———

The mind of a man is like a clock that is always running down, and requires to be constantly wound up. —*Wm. Hazlitt.*

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From the Great Lakes to the Gulf the

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You use the same chemical for both ground and wood treatment.

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Is practically unaffected by normal heat nor moisture so it stays where you put it.

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Practically eliminates expensive re-treats when our simple recommendations are followed.

Phosphorous Paste for Rats and Roaches. Contains 7%-8% ZINC PHOSPHIDE with a scent very attractive to these pests. Easily diluted with water to mix with bait. Sample pound can 50c post paid. 5 lb. can at $2.00. 10 lb. can at $3.75 f.o.b. Memphis, Tenn.

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Manufacturers of Pest Control Chemicals

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Repellents in Rat Control

By ERNEST M. MILLS *and* JAMES C. MUNCH, *U. S. Fish and Wildlife Service*

A RAT repellent might be defined as "any substance placed in the runways of rats that will prevent them from going where they wish." Reasons for the need of such repellents are many. It is not always desirable or possible to use toxic baits, traps, rat proofing, or similar methods of control. It is advantageous to use repellents as a long-time measure to protect stored materials, in place of the constant use of traps, gases or poisons. Repellents may drive rats from inaccessible or undesirable places to more convenient locations for trapping or poisoning. Repellents may prove to be the cheapest means of control in cases of light infestations.

Very few published scientific investigations to determine efficient repellents have been found in a search of the literature. Many studies have been made which are unpublished, since they were too brief, inconclusive, or negative in their findings, as learned from personal communications. There are many factors to complicate a biological experiment of this type, so that a large number of such tests must be made under various conditions to obtain adequate data permitting statistical interpretation of results. Cage tests or specially constructed sets generally give some indication of what may take place in the field under normal conditions; however, it is necessary to confirm these findings by field tests under practical conditions since the conclusions may not be the same.

One extensive test has been made by James Silver and Frank N. Jarvis, of this Service[3]. Ten large gray rats were turned loose in a tight garage. A food box with five compartments was placed on the floor of the garage, and no other food was made available. The various repellents were placed in a sponge cup in each compartment near and in front of the food. The products were shifted from time to time in order not to influence stronger or weaker products in adjoining compartments. Daily observations were made but only a summary of the results will be given. The following products were tried: asafoetida, tar camphor, carbolic acid, chlorinated lime, coal tar, copper sulfate, creosote, iron sulfate, lead nitrate, naphthalene flakes, oil of peppermint, oil of wintergreen, pine tar, pyridine, sulfur, and zinc chloride. The only product giving one hundred percent protection to the food for seven days was naphthalene flakes. Powdered sulfur, creosote, carbolic acid, copper sulfate, and chlorinated lime acted as partially repellent. The other products were of little or no value as repellents.

A test on rat and mouse repellents was conducted by Schultz and Pring[2]. A series of twenty-four substances were incorporated with flour pastes, with controls of plain flour. The substances used were aniline, asafoetida, cayenne pepper, cedarwood oil, oil of citronella, oil of cloves, creosote, diphenyl oxide, oil of eucalyptus, furfural, furoic acid, oil of mirbane, naphthalene, beta-naphthol, oil of pine, potassium nitrate, quassia, quillaja, quinine oleate, sodium fluoride, sodium nitrate, sulfur, terpineol, and oil of wintergreen. Those substances having marked effects as repellents were cedarwood oil, diphenyl oxide, naphthalene, and sodium fluoride. Oil of mibrane was considered fair. The others had no repellent value.

An interesting study was made with white rats on their olfactory sensitivity, by Liggett[1]. Liggett found that oil of cassia and oil of bergamot repelled rats. He also states that oil of anise was neutral but that amyl acetate (banana oil) was an attractant. The conclusion was made that the rat is probably no more sensative to odor stimuli than is man.

There are many citations in the more or less popular literature concerning the value of substances as rat and mouse repellents. The most frequently mentioned materials are carbolic acid, caustic soda, coal tar, copperas, creosote, gas tar, chloride of lime, freshly-slaked lime, naphthalene, oil of peppermint, pine tar and sulfur.

A summary of field observations and the experiments indicates that naphthalene flakes are the best deterrent. Other odorous preparations appearing to have merit are carbolic acid, cedarwood oil and creosote. The

[1] Liggett, Charles. Genetic Psychology Monographs, Vol. 3, No. 1, 1928, Clark University.

[2] Schultz and Pring. The Corn Cob, Vol. 3, No. 33, 1928.

[3] Silver, James and Jarvis, Frank N. Personal Communication.

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Every Responsible PCO Realizes the Imperative of Adequate Insurance Coverage Against the Normal Hazards of His Profession.

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best non-odorous repellents are copperas, lime, lye, sodium fluoride, powdered sulfur, and cayenne pepper.

USE: Repellents are chiefly used in rat burrows or along their runways. In other cases it may be feasible to sprinkle the repellent over furniture, bags or boxes of stored material, or insert into a tight enclosure with the articles to be protected. For example, powdered sulfur has been successfully used by sprinkling it over stored bags of corn. Care should be used to prevent the repellent from injuring the material to be protected and odorous repellents should not be used if the articles will absorb the odor and can not be thoroughly deodorized after treatment. Extreme caution should be exercised in placing the more toxic repellents to prevent accidents, such as contamination of food, injury to children and to careless and irresponsible persons.

Under proper conditions of exposure and use, repellents may serve a very useful purpose.

He that is slow to anger is better than the mighty; and he that ruleth his spirit than he that taketh a city.

—Proverbs XVI:32.

Entomological Literature

RELATIVE EFFECTIVENESS OF ACID LEAD AND OTHER MATERIALS AS STOMACH POISONS FOR THE LARVAE OF THE JAPANESE BEETLE

By Walter E. Fleming, Entomologist, Division of Fruit Insect Investigations, Bureau of Entomology and Plant Quarantine, Washington, D. C. Technical Bulletin No. 788—January, 1942. Price 10c (no stamps).

Discusses: Conditions for testing stomach poisons; Procedure for conducting the tests; Analysis of data; Acid lead arsenate as a stomach poison; Substitutes for acid lead arsenate; Summary and conclusions, etc.

Fierce Wild Mice Hunt for Prey Like Hounds

Fierce wild mice that hunt like hounds, pounce on their prey like tigers and hang on like bulldogs, are described in new Smithsonian annual report by E. P. Walker, assistant director of the National Zoological Park.

They are little rodents known as grasshopper mice, common in the southwest. Like other rodents they eat seed and other vegetable food, but unlike other kin-animals they prefer a meat diet, preying on large insects and small mammals and lizards. They get their name from their fondness for grasshoppers and their success in catching them. . . .

—*Science News Letter.*

"How To Write A Good Ad"

According to Schwab and Beatty, Inc., New York advertising agency, five basic pointers in writing a good ad are:

1. GET ATTENTION. With a layout so striking it stands apart from competition—or so simple its very restraint attracts, and with a headline holding out a promise to do something that people want done for them.

2. SHOW PEOPLE AN ADVANTAGE. What can they save, gain, accomplish with your product, or service?

3. PROVE IT. With facts, specifications, experiences.

4. PERSUADE THEM TO GRASP THIS ADVANTAGE. Sum up. Paint a mind's eye picture of what it will mean to them, why they should have it, how easy it is to get it.

5. ASK FOR ACTION. Don't let them trail off. Give them something specific to do at once!

It is not the situation which makes the man, but the man who makes the situation. The slave may be a free-man. The monarch may be a slave.

—*F. W. Robertson.*

J-O PASTE

To the vermin exterminator who is desirous of extending an outstanding service to his client J-O PHOSPHORUS PASTE *is* the solution

For the control of rats and roaches this product is widely and successfully used by Pest Control Operators throughout the country.

J-O ROACH TRAP

For use with J-O Paste

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Send $1.00 and we will ship to you postpaid a two-pound can of J-O Paste, with twenty-four J-O Roach traps, as illustrated.

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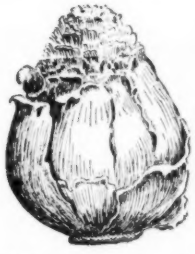

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Effectiveness of Deratization of Ships by Trapping

By G. C. SHERRARD, *Acting Assistant Surgeon*, and C. J. VION, *Senior Clerk*,
United States Public Health Service

AS A means of reducing the rat population on infested ships, trapping has been productive of excellent results at the Port of New York. During the past 3 years this activity has been made a responsibility of the vessels concerned, with the Public Health Service exercising general supervision through frequent inspections and recommendations. The actual trapping has been accomplished in most part by members of each ship's crew. However, in some instances private exterminators have been employed during the vessel's stay in port.

While the examples of the effectiveness of trapping herein presented have been chosen on account of the rather spectacular results obtained, no less satisfactory accomplishments have been obtained on a very much larger number of vessels with only slight or moderate infestation. On these vessels, by persistent and continuous application of sanitary procedures in conjunction with trapping, the rat population has either been eliminated or reduced to a negligible number.

From the large number of vessels engaged in foreign trade and calling at New York, the accompanying list of 20 vessels has been chosen to illustrate the possibility of accomplishing satisfactory deratization by means of careful trapping.

The actual number of rats trapped is probably greater than the report indicates as only the dead rats actually collected by sanitary inspectors have been counted. It frequently happens that longshoremen or members of the ship's crew throw the bodies overboard before they can be collected by a designated crew member or the sanitary inspector. On the other hand, the number of rats estimated is frequently less than the number actually present on board. This is due in many cases to the fact that the vessels are fully loaded with inbound cargo at the time of the inspection and only the rat evidence on the top of the cargo can be seen.

During the 12-month period ended February 1, 1941, 2,910 rats were recovered as a result of trapping operations on vessels entering the Port of New York. This did not include a considerable, but unverified, number reported trapped at sea.

As none of the rats included in the present account were trapped by employees of the United States Public Health Service, it will be seen that the results represent commendable cooperation on the part of the ship's crew.

To obtain satisfactory results from trapping, a considerable expenditure

TABLE 1.—Estimated number of rats present on 20 selected vessels engaged in foreign trade and number of rats trapped under the direction of the Public Health Service at the Port of New York.

Nationality	Vessel	Net Tonnage	Number of Rats Estimated	Number of Traps Set	Number of Rats Recovered	Number of Days Trapped	Remarks
Greek	S. S. A. M.	2,476	21	36	17	3	Trapping in progress at sailing time.
British	S. S. A.	4,077	15	24	11	6	Do.
Greek	S. S. A.	1,791	8	14	21	42	Do.
British	S. S. D.	2,802	15	24	15	4	Do.
Japanese	S. S. D. M.	4,383	12	20	22	6	Trapping in progress at sailing time. Final estimate 5.
Norwegian	S. S. E. S.	3,533	33	36	28	16	Trapping in progress at sailing time.
Finnish	S. S. I. R.	1,314	15	24	17	25	None trapped last 4 days.
British	S. S. K.	2,426	10	..	9	6	
British	S. S. K. I.	3,164	14	24	37	3	Trapping in progress at sailing time.
Norwegian	M. V. L.	1,886	26	36	40	5	Do.
Portuguese	S. S. L. M.	3,857	8	24	35	8	Do.
Polish	S. S. M. W.	1,911	12	41	51	8	Trapped 20 on voyage. Final inspection negative.
Greek	S. S. M. R.	3,192	16	..	27	5	Trapping in progress at sailing time.
Greek	S. S. N.	2,989	14	24	12	6	
Norwegian	S. S. N.	3,143	15	27	46	9	Final inspection negative.
Belgian	S. S. P.	3,293	15	24	15	3	Trapping in progress at sailing time.
Norwegian	S. S. S.	2,460	16	24	11	5	Do.
Egyptian	S. S. S.	1,842	25	42	30	4	
Norwegian	M. V. T. Y.	3,806	14	36	71	12	
British	S. S. W. W.	2,627	11	24	13	8	Do.
Totals	20	....	315	..	528	..	

Average number of traps set on 18 vessels: 28.
Average number of days traps were set: 9.2.

When Writing to Advertisers Mention "Pests"

of effort is required in educating designated members of crews of infested vessels. At the Port of New York this is mostly accomplished by instruction imparted by sanitary inspectors to the personnel of vessels and also by the distribution of printed instructions on trapping to chief officers and others concerned.

In this connection it is desired to emphasize the general importance of ship sanitation, including elimination of rat harborages and of waste food products as a necessary adjunct to deratization by trapping. Hunger resulting from deprivation of the customary food supply, and the disturbance of rats' harboring and nesting places by the application of appropriate sanitary measures greatly increase the effectiveness of trapping.

From our experience we conclude that supervised trapping on infested vessels, from the first United States port of call until the vessel is completely deratized or sails for a foreign port, is producing effective results.

—Public Health Reports, Vol. 56, May 16, 1941, Number 20.

Unmolested, a pair of flies approaches six trillion progeny in six months.

Fifth Pacific Coast PCO Conference Program

(Continued from Page 5)

Friday

7:30 p.m. Round-Table Discussion—
I. Structural Pests.
II. Carpet Beetles.
E. A. Michelbacher
E. Gorten Linsley
Dr. G. F. MacLeod, Chm.

Saturday, Agriculture Hall

9:00 a.m. The Role of Temperature and Humidity in Pest Control—R. Craig.

9:45 a.m. Wasps and Hornets — A. E. Michelbacher.

10:30 a.m. Recess.

10:45 a.m. Accident Prevention in Pest Control Work—C. H. Fry, G. A. Rader.

11:30 a.m. Real Estate Activity in War-Time—M. G. Read.

12:00 Noon Conference Impressions by PCOs. Hotel Durant: Chairman, C. J. Menard.

Saturday, Agriculture Hall

1:30 p.m. Laboratory Sections (Household Pests, Public Health, Temperature and Humidity, Toxicology).

3:00 p.m. Laboratory Sections (Household Pests, Public Health, Temperature and Humidity, Toxicology).

Saturday, Claremont Hotel

6:30 p.m. A Night in Rio. Spanish Room at Hotel Claremont.
Toastmaster: Prof. William B. Herms.
Master of Ceremonies: Dr. G. F. MacLeod.

Life-Span of Ant Hills

The teeming minature city-states that we call anthills have a life span of their own, a time during which they grow, flourish, decline and die, just as did Ninevah and Tyre, Dr. William A. Dreyer of the University of Cincinnati told an audience of zoologists attending the meeting of his studies on a group of great ant hills in northern Illinois, which indicated that the average life span of life for such a community is from 12 to 20 years.

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Automobile Insurance Facts

By LeROY A. WEISBURGER, *New York City*

THE New York State Legislature passed unanimously during 1941, the New York State Motor Vehicle Safety Responsibility Law. It was signed by Governor Lehman on April 30th, 1941, and took effect January 1st, 1942.

This Law affects directly all owners and drivers of private passenger automobiles and business men who operate trucks and passenger cars in New York State. Employers of persons using cars in the performance of their duties are also affected in that it is to their interest to make certain that employees will not lose the important right to drive.

By passing this comprehensive Law, New York State has recognized the need for some detailed safety program with real teeth in it. With this indication of the need for protection of persons injured, or whose property has been damaged by motor vehicles, it has been clearly driven home that the present trend is towards placing the burden more heavily on the uninsured owner.

The law is not necessarily restricted to residents. Non-residents will find that the Commissioner has the power to forbid the operation of an automobile in this State which has been involved in an accident to the same extent as he may forbid such operation by residents. In addition, the home State of the non-resident will be furnished with a record of convictions or judgments obtained in New York State against a non-resident.

With this reciprocal agreement between various States in operation, motor vehicle operators will be made to realize their obligation to the public when through negligence, they cause personal injuries or property damage.

Financial responsibility of motor vehicle operators has been one of the chief problems of Commissioners and the trend to some form of compulsory automobile insurance which started in Massachusetts will eventually be followed by other States.

It is common knowledge that automobiles take more lives annually than many hazardous occupations and fatalities are ever increasing. Because of this, public opinion has been aroused to the point where it has felt that an uninsured driver should be made to pay the penalty for indifference and negligence when human life and limb become involved. Today, the right to drive a car may be forfeited if the driver cannot prove financial responsibility in the event of an accident.

In the event an operator of a motor vehicle is convicted of any of the following offenses, all of which call for revocation or suspension of license: Homicide; Assault; Speed Violation; Reckless Driving; Criminal Negligence; Driving while intoxicated; Leaving the scene of accident without reporting; Operating while license of operator or registration of automobile is suspended. False statement in application for operator's license or registration of automobile, the Court is required to furnish the Commissioner of Motor Vehicles with a Certificate of Conviction. This is obligatory regardless of whether or not an accident has occurred. It is therefore obvious that the operator of an automobile is immediately placed on the defensive in the event of conviction for one of the foregoing offenses.

Aside from the human element being the cause of many automobile casualties, mechanical failures and deficiencies of cars will begin to play an important part in causing accidents. As new cars become more difficult to obtain and replacement of parts more and more scarce, old cars in poor mechanical condition will be a potential cause of many accidents. Driving at high speeds, especially with worn tires, to name one of many causes, will in all probability be responsible for many fatalities. The driver who loses sight of the fact that an automobile is a machine which must be kept in constant repair will certainly feel the effect of the financial responsibility laws.

The question of automobile accidents during blackouts have been asked and as far as the writer can ascertain, full coverage under the standard personal injury and property damage policy is afforded for the time being. In all probabilities, the National Bureau of Casualty and Surety Underwriters will make specific provisions for this contingency as the need arises. It is needless to point out that driving should be avoided if at all possible during a blackout because common sense tells us that if thou-

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sands of accidents occur during broad daylight under perfect driving conditions, the possibility of accidents during a blackout is increased many fold.

So many persons are heard to remark to the effect that because they carry automobile personal injury and property damage insurance, they are privileged to drive carelessly. But, they forget an important fact and that is, that the cost of their insurance increases with their accident experience. To use New York State as an example, a conviction for reckless driving by the operator of an uninsured car increases the cost of his insurance, which he must obtain immediately, by fifty per cent. It then can be readily seen that recklessness is expensive in more ways than one.

In spite of increasing automobile accidents, policy contracts are continually being broadened in scope. The standard policy today not only covers the insured owner, but also covers all persons driving the car with the insured's permission. The policy also affords coverage to the insured or his or her spouse while driving any other private passenger car, providing the insured car is a private passenger car.

Even though policy contracts have been broadened to provide greater benefits to the insured, it must always be remembered that there is no insurance written that can replace a life or limb, for money cannot buy those once they are destroyed. Therefore, one should bear in mind that in many states where insurance costs depend on the accident experience of each individual driver, the only way to keep these costs down is to drive with plain common sense, especially under present conditions when used cars will be much more in evidence than ever before and naturally, the average used car is not in as good mechanical condition as a new one.

To repeat a time worn pun—"One can replace or repair almost anything on an automobile except the nut behind the wheel."

———•———

A surgeon, an architect, and a politician were arguing about the relative ages of their professions.

The surgeon related that Eve was made out of one of Adam's ribs and that implied surgery.

The architect claimed that the arrangement of matter out of chaos indicated architecture.

The politician beamed, "But it took someone to make the chaos!"

Fly Lights Itself Fore and Aft, Eats Spiders!

A fly that spins a web for catching spiders and other insects was described (December, 1940) before the meeting of the Entomological Society of America in Philadelphia by Dr. B. B. Fulton, of North Carolina State College. The fly, strangely enough, plays its spider-like role only when it is still in the larva stage, when it looks very much like a small worm. At that time the larva devours small spiders and other prey caught in the web. When it grows up and becomes a fully developed winged adult it becomes a mild vegetarian, feeding harmlessly enough on mushrooms, Dr. Fulton reported. The incredible insect is luminous like a firefly or glow worm; only it goes the firefly one better by carrying lights both fore and aft. Its front segment and its five rear segments shine with a weird blue light. The fly was named platyura fultoni in honor of Dr. Fulton by its discoverer, Dr. Elizabeth Fisher, a fellow entomologist.

—*The World Almanac, 1942.*

———•———

From Our Department of Interesting Information

More than a million dollars—$1,192,000, to be exact—will be spent during the coming twelve months on antimosquito defense in and around the 53 major military areas in which United States troops are quartered. The work will be done by civilian specialists and laborers, under the direction of 87 sanitary engineers, all of them mosquito-eradication experts.

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Distribution and Hosts of Some Fleas of Economic Importance

By HELEN LOUISE TREMBLEY and F. C. BISHOPP, *U. S. Department of Agriculture, Bureau of Entomology and Plant Quarantine*

IN THE course of investigations the Division of Insects Affecting Man and Animals, of the Bureau of Entomology and Plant Quarantine, has accumulated considerable information concerning the geographical distribution and hosts of fleas of the United States. Owing to the numerous inquiries received, it is felt that this material should be published. Data regarding the following economically important species are presented herein: *Ctenocephalides felis* (Bouché), the cat flea: *C. canis* (Curt.), the dog flea; *Pulex irritans* L., the human flea; *Xenopsylla cheopis* (Rothsch.), the oriental rat flea; and *Echidnophaga gallinacea* (Westw.), the sticktight flea.

Use has been made of the Division's accession catalogue, note file, letters recording receipt of specimens, and records indexed from literature. No attempt has been made to include all published records. Reports taken from literature only are preceded by an asterisk. In the geographical distribution lists literature reports are used only where they record distribution in additional states.

The figures appearing opposite host names represent the number of times fleas were taken. These numbers are not an exact index to the relative importance of hosts, but they are indicative.

Determinations for the most part have been made by H. E. Ewing, M. A. Stewart, and the writers.

Ctenocephalides felis (Bouché).—The cat flea is the flea most common as a household, kennel, office, and lawn pest. *Ctenocephalides felis* is abundant in the East, but relatively scarce in the West, as indicated by the fact that the Division has no specimens from the Great Plains and Rocky Mountain regions, and in the far West only Idaho, Oregon, and California are represented. It has been collected every month of the year, although heavier infestations apparently occur during warm weather or when houses are opened after summer vacations. One heavy infestation in an automobile occurred in March.

Hosts.—Man 94; dog 34; cat 16; opossum 4 (*Didelphis virginiana pigra* 1, *Didelphis* spp. 3); bobcat, cow, hen, gray fox (*Urocyon cinereoargenteus floridanus*), raccoon, gray rat (*Rattus norvegicus*), "rats," Florida skunk (*Mephitis elongata*), bat, each 1; *red squirrel; *"skunks"; *flying squirrel; *rabbit. The geographical distribution is as follows:

Alabama: Birmingham.

California: Nicé.

Connecticut: Arcadia Sound Beach, Windsor Locks.

District of Columbia: Chevy Chase, Washington.

Florida: Christmas, Homestead, Immokalee, Jacksonville, Leon County, Miami, New Smyrna Beach, Orlando, Tallahassee.

Georgia: Fort Valley, Newton, Valdosta.

Idaho: Sandpoint.

Illinois: Chicago, Elmhurst, Kankakee, Moline, Rock Island, Urbana.

Indiana: Mishawaka.

*Iowa: Iowa City, Sioux City, Rogers, Mt. Pleasant, Ames.

Kansas: Fort Leavenworth.

Kentucky: Paducah, West Point.

Louisiana: New Orleans, Tallulah.

Maine: Portland.

Maryland: Baltimore, Frostburg, Hagerstown, Rockville, Silver Spring, Takoma Park.

Massachusetts: Cohasset, Malden, Mattapan, New Bedford, West Newton.

Mississippi: McNeill.

Missouri: St. Louis.

New Jersey: Browns Mills, Franklin, Freehold, High Bridge, Jersey City, Leonia, Mercerville, Midland Park, Newark, Normandy Beach, North Bergen, Nutley, Perth Amboy, Phillipsburg, Scotch Plains, Woodcliff Lake.

New York: Brooklyn, Buffalo, Floral Park, Forest Hills, Newburgh, New York City, Niagara Falls, Peekskill, Rochester, Springfield Gardens, White Plains.

North Carolina: Battleboro, Halifax.

Ohio: Akron, Cincinnati, Cleveland, Columbus, Lima, Lorain, Marietta, Mayfield Heights, Painesville, Steubenville, Tiltonsville, Willoughby, Wyoming.

Oregon: Bonneville Dam, Corvallis, Klamath Falls, Portland.

Pennsylvania: Beaver Falls, Bethlehem, Larimer, Leechburg, Philadelphia, Pittsburgh, Scranton, Sellersville, Sharon Hill, Tarentum, Verona, Williamsburg.

Rhode Island: Woonsocket.

South Carolina: Capers Island (Charleston County), Sumter.

Texas: Armstrong, Brownsville, Dallas, Edinburg, Groesbeck, Menard, Raymondville, Roosevelt, San Antonio, Sonora, Uvalde, Verde Cave (Medina County), Victoria.

Vermont: Woodstock.

Virginia: Accomac, Arlington, Quantico, Waverly.

Ctenocephalides canis (Curt.).—Although submitted for identification less frequently than the cat flea, the dog flea is a fairly common pest in houses, barns, and lawns. The files of the Division of Insects Affecting Man and Animals contain no records from the Rocky Mountain and Intermountain regions. Seasonal distribution is similar to that of *Ctenocephalides felis*, its occurrence being reported every month, but more frequently in warmer weather.

Hosts.—Dog 40; man 16; cat 3; gray fox 2; cottontail rabbit 1; hare (*Lepus w. washingtoni*) 1; cow 1; *gray rat (*Rattus norvegicus*); *black rat (*R. r. rattus*); *"rats"; *house mouse (*Mus. m. musculus*); *California ground squirrel; *woodchuck; *red fox (*Vulpes regalis*). The geographical distribution is as follows:

Arkansas: Georgetown.

California: Azusa, Los Angeles, San Diego.

Connecticut: Windsor Locks.

Delaware: No definite locality.

District of Columbia: Congress Heights, Washington.

Florida: Tallahassee.

Georgia: Fort Valley, Macon.

Illinois: Calumet City, Chicago, Urbana.

Indiana: Fillmore.

Iowa: Ames.

Kansas: Manhattan.

Kentucky: Verona.

Maine: Fryeburg.

Maryland: Baltimore, Churchton, Deale, Hyattsville, Laurel.

*Massachusetts: Wenham, South Swansea.

Michigan: Northville.

Mississippi: Lucedale.

Missouri: Macon.

*New Hampshire: Canobie Lake.

New Jersey: Browns Mills, Freehold, Gloucester City, Long Branch, Newark, New Brunswick, Paterson, Riverton.

New York: Rochester, Yonkers.

North Carolina: Asheville, Halifax, Raleigh, Spray.

Ohio: Akron, Cincinnati, Geneva, Loveland.

Oregon: Bonneville Dam, Corvallis, Cottage Grove, Klamath Falls, Portland, Salem.

Pennsylvania: Carnegie, Coatesville, Harrisburg, Lancaster, Lemoyne, Pittsburgh, Pottsville, Westtown.

South Carolina: Bethune, Charleston.

South Dakota: Watertown.

Texas: Concan, Dallas, Fort Worth, Menard, Port Lavaca, Rosemont.

Virginia: Fredericksburg; Manchester, Richmond, Warsaw.

Washington: Blaine, Centralia.

West Virginia: Fort Gay.

Wisconsin: Milwaukee.

Pulex irritans L.—The human flea causes severe annoyance in buildings, farmhouses, stables, and surrounding premises, especially in the Middle West and South and on the Pacific Coast. It is the predominant species affecting man on the Pacific Coast. Collections have been comparatively uniform throughout the year, with warmer weather apparently favoring the fleas. Collections in the winter months are mostly from the South and the Pacific Northwest.

Hosts.—Man 36; dog 36; coyote (*Canis lestes*) 9; prairie dog 6; rabbit (cottontails and jack rabbits) 5; hog 4; burrowing owl (*Speotyto cunicularia hypogaea*) 3; opossum 3; skunk 3 (*Mephitis occidentalis holzueri* 1, "skunk" 2); bobcat 2; gray fox 2; deer 2 (*Odocoileus c. columbianus* 1, "deer" 1); badger 2; Georgian bat (*Pipistrellus subflavus*), wolf, cat, peccary, gray rat (*Rattus norvegicus*), rock squirrel, each 1; *black rat (*R. r. rattus*); *chicken; *house mouse (*Mus. m. musculus*); *California ground squirrel (*Citellus beechyi*); *red fox (*Vulpes regalis*); *gray squirrel.

"Rats" are recorded as hosts of the human flea, but this flea has not been accessioned from them. Horses and mules are often much annoyed by this flea when associated with hogs, although no collections from them have been accessioned. The geographical distribution is as follows:

Alabama: Mobile.

Arizona: Congress Junction, Phoenix.

Arkansas: Georgetown, Omaha.

California: Azusa, Coachella, Nice, Oxnard, Pasadena, San Francisco, San Luis Obispo.

*Colorado: Larimer County.

District of Columbia: Washington.

Florida: Christmas, Melbourne, Quincy.

Georgia: Brunswick, Fort Valley.

Illinois: Elmwood, Galesburg, Kempsville, New Salem, Nokomis, Winchester.

Indiana: Fairland, Frankfort, Wheatfield.

Iowa: Clarinda, Wapello County.

Kansas: Hutchinson, Manhattan.

Louisiana: Leesville, Mound, New Orleans, Port Barre, Tallulah.

Maryland: Bethesda, Hyattsville, Laurel.

Massachusetts: Fall River, New Bedford.

Michigan: No specific locality.

Mississippi: Dundee, Rosedale.

Missouri: Atlanta, Charleston, Gilliam, Mexico.

Nebraska: Mullen, "Sand Hills of Nebraska" (Cherry County).

New Jersey: Browns Mills.

New Mexico: Roswell.

*New York: Brooklyn, Schenectady, Springfield, Springville.

North Carolina: Battleboro, Halifax, Raleigh, Spray.

Ohio: Cincinnati, Fremont, Pandora.

Oklahoma: Bluejacket.

Oregon: Albany, Brooks, Heppner, Hermiston, Keno.

Pennsylvania: Chadds Ford, Harrisburg, Lancaster, Oxford.

South Carolina: Charleston, Timmonsville.

Tennessee: Isabella.

Texas: Alpine, Armstrong, Brownsville, College Station, Colorado City, Concan, Dallas, Edinburg, Fort Worth, Greenville, Groesbeck, Hamlin, Laredo, Louise, Menard, Midland, Mirando City, Port Lavaca, Raymondville, Rocksprings, Sabinal, San Angelo, San Antonio, Sonora, Uvalde, Van Horn.

Utah: Vernal.

Virginia: Richmond, Temperanceville, The Plains.

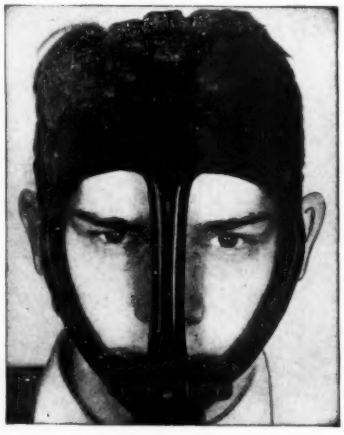
Washington: Connell, Spokane.

West Virginia: Fort Gay.

Wyoming: Laramie.

(Continued on page 28)

P.C.I. Fumigation Standards Make Safety First a Must — Thoughtful Fumigators Everywhere Are Equipping Their Service Staffs With Acme Full Vision Gas Masks* . . .



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THE WORLD'S LARGEST BOTANICAL DRUG HOUSE

Xenopsylla cheopis (Rothsch).—The oriental rat flea is not a general house hold pest, but is important because it is found on domestic rats and is a vector of bubonic plague.

This flea was reported, on August 10, 1938 (Bishopp No. 28064), as infesting an office building in Youngstown, Ohio, where it was "biting the men working there and causing considerable discomfort."

In Nashville, Tenn., a male and female *Xenopsylla cheopis* were submitted by H. E. Meleney (Bishopp No. 28684) from rats captured in a grain store in the city near the Cumberland River in March, 1938. To the writer's knowledge these were the first oriental rat fleas reported from Tennessee since 1908, when the Surgeon General of the United States Public Health and Marine Hospital Service recorded it in his Annual Report as *Pulex pallidus*, from Memphis. The species is most commonly met with in seaports.

Collections of *Xenopsylla cheopis* have been made and submitted for determination throughout the year except in February. Collections, however, are reported for February in literature.

Hosts.—"Rats" 13; gray rat (*Rattus norvegicus*) 8; cotton rat (*Sigmodon h. hispidus*) 5; roof rat (*R. r. alexandrinus*) 4; black rat (*R. r. rattus*) 1; house mouse (*Mus m. musculus*) 1; man 1; cottontail rabbit 1; *California ground squirrel (*Citellus beecheyi*). The geographical distribution is as follows:

California: San Pedro.
District of Columbia: Washington.
Florida: Orlando, Tallahassee.
Georgia: Newton, Thomasville, Valdosta.
*Illinois: Urbana.
*Indiana: Indianapolis.
Iowa: Ames.
*Louisiana: New Orleans.
*Maryland: Berwyn, Baltimore.
*Massachusetts: No definite locality.
*Minnesota: St. Paul.
*New York: Rochester, New York City.
*North Carolina: No definite locality.
Ohio: Youngstown.
*Pennsylvania: Philadelphia.
Rhode Island: Providence.
Tennessee: Nashville.
Texas: Brownsville, Dallas, Fort Worth, Galveston, Uvalde.
*Virginia: Norfolk.
*Washington: Seattle.

Echidnophaga gallinacea (Westw.).—The sticktight flea is recorded as a serious pest in hen houses and barns. It is most serious in the Southern States, where it frequently causes death of poultry and lowered egg production. Because of its habits this flea is readily shipped out of its normal range, and this accounts for the isolated records in the North. It attacks mammals and birds alike and is accessioned frequently every month of the year, although it is an accepted fact that infestations are heavier during relatively cool, dry weather. Heavy rains have at times caused almost complete disappearance of this flea in some localities.

Hosts.—Dog 22; poultry 16 (chickens 14, turkey 2, domestic duck 2); rabbits 11 (*Sylvilagus a. auduboni* 1, *S. auduboni arizonae* 1, *S. auduboni sanctidiego* 5, *Sylvilagus* spp. 5); rabbit (laboratory animals) 2; cat 6; California ground squirrel (*Citellus b. beecheyi*) 6; gray rat (*Rattus norvegicus*) 6; roof rat (*R. r. alexandrinus*) 5; man 4; gray fox 4 (*Urocyon cinereoargenteus floridanus* 3, *U. cinereoargenteus* subsp. 1); burrowing owl (*Speotyto cunicularia hypogaea*) 4; skunk 3 (*Mephitis elongata* 2, "skunk" 1); rock squirrel 3; prairie dog 2; English sparrow 2; raccoon 2; opossum 2; bobcat 2; western meadowlark, sharp-shinned hawk, red-tailed hawk, northwestern flicker (*Colaptes cafer*), blue jay, great horned owl (*Bubo virginianus*), killdeer, black rat (*R. r. rattus*), deer, red fox (*Vulpes fulva*), western badger (*Taxidea taxus neglecta*), coyote, "rat," "wood rat," walnut rock squirrel (*Citellus variegatus juglans*), gray squirrel, hog, each 1; *horse; *quail; *Cooper's hawk (*Accipiter cooperi*); *Florida bobwhite (*Colinus virginianus floridanus*). The geographical distribution is as follows:

*Alabama: Auburn.
Arizona: Pinal, Safford, Tucson, Wickenburg, Yarnell.
*Arkansas: Imboden.
California: Coachella, Corcoran, Fontana, Kerman, Linda Vista Hills (Los Angeles County), Marysville, Mission Beach, Palmdale, Richfield, San Ysidro, Tropico, Verdugo Hills (Los Angeles County), Woodland, Yuba City.
Florida: Christmas, Dunedin, Eustis, Gainesville, Jacksonville, Jacksonville Beach, Orlando, Tallahassee, Zephyrhills.
Georgia: Beachton, Brunswick (Blythe Island), Nashville, Newton, Savannah, Valdosta.
*Kansas: No definite locality.
Louisiana: Leesville.
*Minnesota: No definite locality.
Mississippi: McNeill.
Missouri: Poplar Bluff.
New Mexico: Elephant Butte Dam, Pleasanton, Roswell.
*New York: New York City.
North Carolina: Battleboro, Grifton, Halifax, Raeford, Wilmington.
*Oklahoma: No definite locality.
Oregon: Maupin.
*Pennsylvania: Philadelphia.
*Rhode Island: Providence.
South Carolina: Bethune, Capers Island (Charleston County), Conway, Florence, Georgetown, Sumter.
Tennessee: Kelso.
Texas: Abilene, Alpine, Anson, Armstrong, Brownsville, Corpus Christi, Dallas, Dimmit County, Edinburg, Hamlin, Junction, Laredo, McKinney, Midland, Morales, Port Lavaca, Raymondville, San Antonio, Sabinal, Sinton, Sonora, Uvalde, Victoria.
Virginia: Waverly.

—*Journal of Economic Entomology.*

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LOCAL ORGANIZATION NEWS

Joint Meeting New York Pest Control Association and Professional Exterminators Association, New York City

Over forty firms attended the joint meeting of the New York Pest Control Association and the Professional Exterminators Association held at Hotel Commodore, New York City on Tuesday, January 20th. Presidents Joe Finneman and Bill Buettner presided.

The principal order of business was a discussion of changing conditions that call for increased costs involving labor, chemicals, overhead and taxes and the need of a constructive program that would first evaluate the percentage increases which would be presented at a subsequent meeting. It is obvious that these increases will necessitate additional charges for maintenance service operations. A committee composed of Justin Simon, S. S. Rosen and Irving Drucker will make a careful study of the problem.

W. J. Parker, Secretary-Treasurer of the New York Pest Control Association, submitted his treasurer's report showing a balance of $6,000.00 on hand. It was unanimously voted that the New York Pest Control Association purchase a $1,000.00 Defense Bond and make a contribution of $50.00 to the American Red Cross. An unexpected surprise came to Bill Buettner as he was presented by Joe Finneman on behalf of the Professional Exterminators Association with a beautiful travelling file leather bag and a purse of $500.00 by the New York Pest Control Association.

Among those present were: Mr. and Mrs. Raymond Sulzer, Gladius Exterminators; Irving Drucker, Banex Exterminating Co.; Max E. Blinder, Josephson Disinfecting Co. and Oriental Exterminating Co.; A. K. Montag and W. J. Parker, W. J. Parker, Inc.; Clarence Lieberman, Thoro Exterminating Co.; Morris Feldman, Columbia Exterminating Co.; Seymour Bayer, Sudex, Inc.; K. W. Tompkins, Bliss Exterminator Co.; W. O. Buettner, Buettner Pest Control Co.; Arthur W. O'Connor, Security Exterminating Co.; Joseph Finneman, Pest Control Corp.; W. A. Elliott, Original Roach Exterminating Co.; Ted Schmerl, Disinfecting and Exterminating Corp.; H. G. Irving Sameth, Sameth Exterminating Co.; S. S. Rosen, Guarantee Exterminating Co.; Sidney Wimmer, Majestic Exterminating Co.; William J. Shrimplin, Rose Exterminating Co.; Charles Pomerantz, Bell Exterminating Co.; A. Dubinbaum, Pest Control Corp.; M. H. Oachs, Ozane Co., Inc.; E. M. West, Continental Exterminating Co.; H. D. Mahler, Mahler Ext. Co.; M. A. Gladstone, Abbot-Madison Corp.; Arthur L. Brody, Pioneer Exterminating Co.; William Farrell, Effective Exterminating Co.; Mrs. T. A. Billings, Steamship Sanitation Co.; Harry Rosenfeld, Worldwide Exterminating Co.; Mrs. E. Mendell, Arpco Products Ext. Co.; J. L. Huberman, A. Scientific Exterminating Co.; John Hauff, Jr., Zenith Ext. Co.; P. H. Haller, Jr., Virus, Ltd.; Justin Simon, General Ext. Co.

Northwest Pest Control Association

The Northwest Pest Control Association held its annual meeting January 20th, at which time the following were elected to office: President, Arnie Athelstan; Vice-President, E. H. Leitte; Treasurer, Everett Needels; Secretary, Max J. Levy.

The California Pest Control Association, Inc.

Pacific Coast Pest Control Operators Conference: Will be held February 19, 20, and 21, 1942, University of California, Berkeley, Calif. The C.P.C.M urges that during these trying times it is more important than ever to learn all we can so we can serve our public better than ever, which practically makes the CONFERENCE a must for all PCOs in geographical proximity.

Material Priority: The C.P.C.M. urgently requests all members to supply data on what each one needs and how much since the Association is in communication with the

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OPM coordinator for the 11 western states and this information is essential to present a case. Word as to materials difficult to procure also needed. Send information to R. E. Hackley or E. G. Mills promptly.

Structural Pest Control Board Considering Restrictions on Fumigations: In which connection the registrar of the board wrote secretary, Bob Hackley, as follows: "In answer to your letter of December 13, 1941, I am of the opinion that the Structural Pest Control Board intends to enact rules and regulations regarding the process or procedure used for the purpose of destroying or controlling rodents, insects, fungi, or other similar pests, which depends upon and involves the liberation, generation, or production of any gas, fume, or vapor, or any combination of gases, fumes or vapors, which when used in such a process is lethal, poisonous, explosive, dangerous or otherwise harmful to human beings."

Gnats Invade Homes in New Orleans: On November 26, 1941, The Times-Picayune, carried a news item concerning statement issued by Dr. Thomas E. Snyder, Senior Entomologist, Bureau of Entomology and Plant Quarantine, New Orleans, advising housewives of the city not to become unduly alarmed if gnats have invaded their homes since they were merely common hackberry bugs which congregate on trees by that name in the summer to suck the juice from the leaves and in the fall they prepare to hibernate, and if there is no natural shelter, they go into the houses. Dr. Snyder stated they are harmless, non-poisonous, don't sting, don't bite, and they will die when the winter comes. He also requested housewives who notice the bugs around their premises next spring and summer to call on the bureau for its suggested method of eradication.

Rats Move In, but Tenants Have no Place Else to Go, titles a page article in New York's newspaper PM, October 31, 1941. The author, Tom O'Connor, states huge rodents have no fear of humans . . . they fight tenants for house room, in describing deplorable conditions extant in New York's underprivileged Harlem area.

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WHAT'S NEW IN PEST CONTROL-PERSONALS

Carl Benson, N. P. C. A. Member, Dies: Prior to his untimely death early in December, Mr. Benson was a partner in the pest control firm of Benson-Vannes Co., Minneapolis, Minn. He was ever cooperative in extending support to those principles which helped to bring the Association to its present high position. He is survived by his wife to whom we extend our sincere condolences.

La Cucaracha or The Roach Approach: Titles an interesting promotional booklet prepared and issued by Philip Mayer, Jr., and Jack Benmosche, Evins Exterminating Co., 44 West 44th St., New York City.

N.A.I.D.M. Meeting: The mid-year meeting of the Association will take place at the Hotel Hershey, Hershey, Pa., with June 8 and 9, 1942, set as the tentative date.

Among the missing at the Purdue PCO Conference were Thos. C. Raley of St. Louis, who because of illness in his family, could not attend; George Hemmert of Detroit, Mich., confined to his bed under doctor's orders; Louis Gatto, who telegraphed a long invitation to all to attend the Tenth Annual Convention in Pittsburgh, Pa., October 26-27-28, and finished his telegram with, "Sorry I could not be there with you this year as I wore out my tires going to California and what little rubber I have left am saving for Pittsburgh Convention."

Mr. Adolph Stern, Federal Fumigating and Exterminating Company of Toledo, Ohio, was injured when hit by an automobile while attending the Purdue Conference, January 8. Aside from bruises there were no injuries and Mr. Stern was able to return to his home in Toledo Friday night, January 9.

Dorothy Josephine Lewis Marries: Miss Lewis is the daughter of Mr. and Mrs. Henry G. Lewis (Rose Exterminator Co., Buffalo, N. Y.). The lucky groom, John Elbert Donovan. They were married on New Year's day at the Kenmore Baptist Church, Kenmore, N. Y., and now reside at Granville, Ohio. Our felicitations to the happy couple.

PCO David Feinson Weds: Mr. Feinson is connected with Atlantic Exterminating Corporation, New Rochelle, N. Y. When interviewed on the details of the event, Mr. Feinson stated the "unlucky" girl is Natalie Mildred Nutting, and that they were married at the Hotel Gramatan, Bronxville, N. Y., and honeymooned at Miami Beach where they encountered very little sun and plenty of rain. No doubt Mr. and Mrs. Feinson will, in due course, make up for the "little sun" with a little son of their own. Congratulations and well wishes to the Feinsons.

PCO's Son Benedict: George Pickhardt, International Fumigators, Ltd., Buffalo, N. Y., is now a happy father-in-law, for his youngest son, Vernon C., and Johanna M. Franceschelli, were married on December 16, in St. Michael's Church, Buffalo, N. Y., after Supreme Court Justice Frank A. James waived the 72 hour law and granted permission for them to obtain a license at City Hall, since Vernon, who is in the Army, had to be back at camp at Camp Shelby, Miss., the Sunday following. The best of all good wishes to the beaming, happy couple whose picture appeared in the Buffalo Evening News with an announcement of the event.

Dick Clowes' Daughter a Bride: Dick's daughter, Amanda Cecelia, was married to Herbert A. Hoffman, on November 25, 1941, in Cumberland, Md. Congratulations and the best of all good wishes to the happy couple. The proud papa is the owner of Anti Termite Co., Pittsburgh, Pa.

Comes word from Hank Smith of St. Paul, Minn., that he spent Christmas with 95 degrees in the shade in Daytona Beach, Fla.

CONVENTIONS—1942

Feb. 15—National School Supplies & Equipment Association, Chicago. Room 307, Shop Section, Palmer House, Chicago.

April 20-22—National Sanitary Supply Association, Hotel Philadelphia. 734 East Lexington St., Milwaukee.

June 22-25—National Association of Building Owners & Managers, Detroit. 134 South LaSalle St., Chicago.

October—National School Cafeteria Association, Chicago. Univ. of Miss., University, Miss.

Oct. 5-9—National Restaurant Association, Chicago. 666 Lake Shore Drive, Chicago.

Oct. 12-16—American Hospital Association, St. Louis. 18 East Division St., Chicago.

Robert E. Hackley Has His Hands Full: Mrs. Hackley has been forced to take a rest cure, which is still in process, and his daughter, Dorothy, is recovering from a serious

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accident which occurred when she was riding horseback. Best wishes for speedy recovery of mother and daughter.

Pest Control and the War — Many employees of our pest control firms have enlisted. We know that many others will follow. Owner-operators are also leaving their businesses. Reserve Officer Leonard Goldman of Providence, R. I., was ordered to active duty to Fort Bragg, N. C., and Charles Partlow of Lafayette, Ind., has also enlisted.

Velsicol Corporation Moves: Since January 15, 1942, the general offices of the Velsicol Corporation have been located at 120 East Pearson Street, Chicago, Ill. Mr. W. E. McCauley is connected with this firm.

Murray Breecher: Hotel Cordozo at Miami Beach, Fla., is given as two weeks' vacation headquarters of Mr. Breecher of New York who operates the Federal Vermin Exterminating Co.

Insect Parts Photographed

Electron photomicrographs of almost unimaginably thin linings of insect breathing tubes were shown to the meeting of the A.A.A.S. by Dr. Glen Richards of the University of Pennsylvania and Dr. T. F. Anderson, R.C.A. Fellow of National Research Council. Some of details invisible even with the highest powers of light-using microscopes help to explain why certain insects are resistant to poison dusts and fumes while others are not.

—*Science News Letter.*

Additional Patents Relating to Pest Control

By DR. R. C. ROARK

EDITOR'S NOTE: *This service is provided through the Department of Agriculture for the purpose of bringing to the attention of those interested such matters that may be of assistance to the industry. The Department of Agriculture assumes no responsibility for the merits or workableness of of any of the inventions mentioned. Copies of all patents can be obtained for 10c (no postage stamps) sent to the Patent Office, Washington, D. C. When placing orders be sure to note the number of the patent, the date, the name of the patentee and the subject of the invention.*

2,247,402 (July 1, 1941; appl. March 24, 1939). ARALKYL PHENOL AND METHOD OF MAKING IT. Ralph P. Perkins and Fred Bryner, Midland, Mich.; The Dow Chemical Company, Midland, Mich. The patentees claim the method of making an aralkyl phenol which comprises reacting a compound selected from the class consisting of 2-aryl-l-alkenes and 2-haloaryl-l-alkenes with a phenol having a hydrogen atom in one of the positions ortho and para to a hydroxyl group and selected from the class consisting of hydroxylated aromatic hydrocarbons and hydroxylated mono-halo-aromatic hydrocarbons in the presence of a hydrogen halide selected from the class consisting of hydrogen chloride and hydrogen bromide. Examples are para-(alpha phenyl isopropyl)-orthocresol, para-(alpha phenyl isopropyl)-meta-cresol, and para-(alpha phenyl isopropyl)-ortho chlorophenol. These compounds are useful in germicides and fungicides, and as intermediates in the manufacture of synthetic resins and insecticides.

2,247,403 (July 1, 1941; appl. March 24, 1939). ARALKYL POLYNUCLEAR PHENOL. Ralph P. Perkins and Fred Bryner, Midland, Mich.; The Dow Chemical Company, Midland, Mich. The patentees claim an aralkyl polynuclear phenol corresponding to the general formula $C_6H_5C(R)CH_2(X)$ where in X is a phenolic radical having a hydroxyl group in one of the positions ortho and para to the aralkyl radical and selected from the class consisting of hydroxylated polynuclear aryl and hydroxylated polynuclear mono-halo-aryl radicals, and R is a substituent selected from the class consisting of lower alkyl radicals. These are useful as

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germicides and fungicides, and as intermediates in the manufacture of synthetic resins and insecticides.

2,247,600 (July 1, 1941; appl. June 14, 1939). MEANS FOR HOUSING AND CONTROLLING THE EVAPORATION OF ODOR BLOCKS. Frank C. Brennan and John S. Brennan, St. Louis, Mo., and Lester J. Reysa, Cedar Rapids, Iowa.; J. S. Costello & Son Brush Co., St. Louis, Mo.

2,247,931 (July 1, 1941; appl. Feb. 6, 1939). METHOD OF AND APPARATUS FOR TRAPPING ANIMALS. William J. Vincent and Cornelius M. Stanton, Rochester, N. Y.

2,248,458 (July 8, 1941; appl. July 15, 1939). PARASITICIDE. William P. ter Horst, Packanack Lake, N. J.; United States Rubber Company, New York, N. Y. An insecticidal preparation contains as active ingredients an organic toxicant derived from derris plant in solution in an oily product of condensation of an ethylene dichloride with chlor toluene having one of its nuclear hydrogen atoms replaced by chlorine.

2,248,610 (July 8, 1941; appl. Nov. 17, 1939). METHOD OF MANUFACTURING DEODORIZING ATTACHMENTS FOR VACUUM CLEANERS. William J. Clements, Chicago, Ill.; Clements Mfg. Co., Chicago, Ill.

2,248,736 (July 8, 1941; appl. May 11, 1938). GARMENT BAG HOLDER. Fredrick C. Bauer, Seville, Ohio.

2,249,134 (July 15, 1941; appl. April 2, 1940). ESTER SUBSTITUTED CYANAMIDE. Ingenuin Hechenbleikner, Stamford, Conn., and Christian Best, Champaign, Ill.; American Cyanamid Company, New York, N. Y. The new compounds beta, beta' dicarbomethoxy (butoxy or octoxy) diethyl cyanamide may be used as an insecticide.

2,249,135 (July 15, 1941; appl. April 2, 1940). BETA, BETA'-DICYANO-DIETHYL CYANAMIDE. Ingenuin Hechenbleikner, Stamford, Conn., and Christian Best, Champaign, Ill.; American Cyanamid Company, New York, N. Y. The new compound beta, beta'-dicyanediethyl cyanamide may be used as an insecticide.

2,249,359 (July 15, 1941; appl. July 20, 1938). INSECTICIDE SPRAYING DEVICE. George Hettinger, East Rutherford, N. J.; Du-La Manufacturing Company, New York, N. Y. This apparatus employs a motor driven air pump by means of which compressed air is forced from a nozzle, the position of which is such that the movement of the air draws the insecticide into its path from a juxtaposed tube, and vaporizes, or sprays, the same in a desired direction.

2,249,601 (July 15, 1941; appl. May 21, 1940). ROACH TRAP. Frank N. Chapman, Kansas City, Mo.

2,250,034 (July 22, 1941; appl. Nov. 7, 1938). SPRAYING DEVICE. Hyman Richard Rich, Milwaukee, Wis.; Enoz Chemical Company, Chicago, Ill.

2,250,345 (July 22, 1931; appl. May 27, 1937). DEODORIZING METHOD. William M. Allison, New York, N. Y.; Oakite Products, Inc., New York, N. Y. A method of preventing and destroying odors in waters employed in pasteurizing equipment comprises incorporating with said waters a germicidal metallo-organic compound containing an organic radical and at least one metal having a valence of at least two, at least one of the valence bonds of such metal being attached to an atom of the group consisting of nitrogen and carbon of said organic radical.

2,250,943 (July 29, 1941; orig. appl. Jan. 21, 1937, divided and this appl. July 22, 1939). METHOD OF FUMIGATING. Robert B. Arnold, Stonewall Courts, Va.; Tobacco By-Products and Chemical Corporation, Louisville, Ky. The patentee claims the method of fumigating with a nicotine fumigating composition, which comprises heating, to a temperature above the boiling point of nicotine, a substantially water-free composition consisting principally of nicotine and containing a liquid hydrocarbon having a boiling point lower than that of nicotine, to form a fume whose nicotine content is mostly in gaseous form, diluting the said fume with exhaust gases while still maintaining the temperature of the mixture above the boiling point of nicotine, and utilizing the diluted mixture as a fumigant. A suitable apparatus is described.

2,251,260 (Aug. 5, 1941; appl. Oct. 26, 1940). INSECT TRAP. Bert C. Chappell, Kansas City, Mo. A trap for crawling insects is described.

2,252,812 (Aug. 19, 1941; appl. Feb. 17, 1940). COMBINED GARBAGE RECEPTACLE AND RAT TRAP. Wallis C. McAnlis, Detroit, Mich.

2,252,908 (Aug. 19, 1941; appl. April 7, 1941). MOUSETRAP. George Wittlief, Douglas, Minn.

2,252,994 (Aug. 19, 1941; appl. Nov. 20, 1939). RODENT AND INSECT EXTERMINATOR. Nicholas R. Tench, Peosta, Iowa. This attachment is designed for use with an ordinary manually operated tire pump for cooperation therewith primarily for spraying insecticide or the like, preferably in powder form for use in exterminating insects and rodents.

2,254,129 (Aug. 26, 1941; appl. March 2, 1940). GERMICIDE. Frederick W. Ames, New Orleans, La. A germicide comprises fifteen fluid ounces of phenol, fifteen fluid ounces of oil of thyme and five gallons of ethyl alcohol.

2,254,276 (Sept. 2, 1941; appl. May 26, 1938). MOTHPROOF WARDROBE. Philip B. Ellis, Ridley Park, Pa.

2,254,665 (Sept. 2, 1941; appl. Sept. 5, 1939). INSECT REPELLENT CONTAINING ALIPHATIC ALCOHOLS. Anderson W. Ralston and John P. Barrett, Chicago, Ill.; Armour and Company, Chicago, Ill. An insect repellent has as its essential active ingredient a primary aliphatic alcohol having from ten to fourteen carbon atoms.

2,254,948 (Sept. 2, 1941; appl. Dec. 13, 1939). INSECT KILLING DEVICE. John Frank Kubalek, Tama, Iowa. This container for a liquid poison is provided with a wick. Lead arsenate and water plus sugar or molasses may be used.

2,255,360 (Sept. 9, 1941; appl. Jan. 12, 1940). INSECT DESTROYER. Milo F. Miller, Kansas City, Mo. An insect destroyer comprises a hollow base wherein to collect the destroyed insects, and an insecticide holder carried by the base.

2,256,561 (Sept. 23, 1941; appl. Jan. 8, 1941). EXTERMINATOR. Otto Hoelscher, Detroit, Mich. A distributor for powdered insecticide is described.

2,257,246 (Sept. 30, 1941; appl. March 4, 1941). ANIMAL TRAP. Faucette S. Rudolph, Yuma, Ariz. This trap may be placed underground in a burrow hole or furrow for exterminating small animals such as rodents, moles, gophers, rats and the like.

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Scientists Trace Human Sleeping Sickness to Common Mosquito Bite

Mosquitoes — carriers of malaria, yellow fever, dengue and many other maladies of man and animals—have been proved one of the transmitting agents responsible for the spread of encephalitis (sleeping sickness of man) and encephalomyelitis (sleeping sickness of horses), the U. S. Department of Agriculture said recently. More than 3,000 cases of human sleeping sickness with about 9 per cent fatalities were reported last year by the U. S. Public Health Service.

Specialists of the Bureau of Entomology and Plant Quarantine, assisted University of California and Washington state and local health authorities in collecting nearly 10,000 mosquitoes, flies and other biting insects this season, and tested them for viruses of these two diseases. The work was conducted in the Yakima Valley of Washington because 27 humans and 40 to 50 unvaccinated horses had sleeping sickness in that area during the summer of 1940.

The insects were identified, frozen and shipped in dry ice to the San Francisco laboratory of the University of California. Then they were divided into lots or "pools" according to family and species, washed, ground and the "liquid" injected into mice. One pool composed of **Culex tarsalis** mosquitoes produced symptoms of St. Louis type sleeping sickness. Another pool of the same kind of mosquitoes produced the western equine sleeping sickness.

While it has been demonstrated previously that mosquitoes can transmit the disease under laboratory conditions, this is the first time that mosquitoes collected in the field have been proved to be carrying the disease virus. The particular species of mosquito found carrying the virus is widespread in states west of the Mississippi.

As a result of this finding, scientists now want to know if: (1) mosquitoes are the only transmitting agents of human encephalo; (2) more specifically, if the **Culex tarsalis** mosquito is the only type that transmits the disease; (3) whether mosquitoes must be abundant in order to cause the disease; and (4) whether mosquitoes harbor the disease between outbreaks. If these facts are established, a plan for mosquito eradication can be mapped that might control sleeping sickness as effectively as mosquito eradication helped control yellow fever. Successful vaccines for horses have been developed and are widely used, but sleeping sickness vaccination for humans is not yet practical.

—U. S. Dept. of Agriculture.

Answers to EAA Questions

Following are the answers to the EAA quiz questions on page 14.

1. No.
2. No. The pressure of the total advertising in a field undoubtedly increases the market as a whole.
3. No. Most copy men prefer to use positive phrasing where possible; "negative" headings are accepted as having value when well used.
4. Black on yellow.
5. No. This practice helps you to identify the date of origin of your idea, but by no means gives you any legal protection.
6. Copper. A zinc plate won't stand up.

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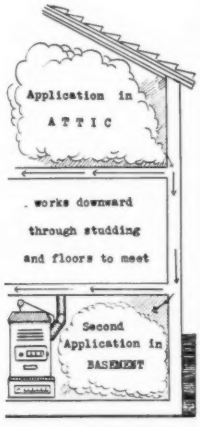

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